

SEQUENCE LISTING

<110> Fritsch Olivier
Hohn Barbara
Lucht Jan Martin

<120> GENE FOR INCREASED SOMATIC RECOMBINATION

<130> 1-32546B/FMI

<140> 10/519,069

<141> 2004-12-27

<150> PCT/EP03/006757

<151> 2003-06-26

<150> GB 0214896

<151> 2002-06-27

<160> 30

<170> FastSEQ for Windows Version 4.0

<210> 1

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<212> DNA

<213> Arabidopsis thaliana

<220>

<221> CDS

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<223> Atino80 sequence

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| Met Asp Pro Ser Arg Arg Pro Pro Lys Asp Ser Pro Tyr Ala Asn Leu | |
| 1 5 10 15 | |
| ttc gat ctc gag ccg ttg atg aag ttt aga att ccg aaa cct gaa gat | 96 |
| Phe Asp Leu Glu Pro Leu Met Lys Phe Arg Ile Pro Lys Pro Glu Asp | |
| 20 25 30 | |
| gaa gtt gat tat tat ggg agt agt agc cag gat gaa agt aga agc act | 144 |
| Glu Val Asp Tyr Tyr Gly Ser Ser Ser Gln Asp Glu Ser Arg Ser Thr | |
| 35 40 45 | |
| caa ggt ggg gta gtg gca aac tac agc aat ggg tct aaa tcg aga atg | 192 |
| Gln Gly Gly Val Val Ala Asn Tyr Ser Asn Gly Ser Lys Ser Arg Met | |
| 50 55 60 | |
| aat gcg agc tcc aag aag aga aag cgg tgg aca gaa gct gag gat gca | 240 |
| Asn Ala Ser Ser Lys Lys Arg Lys Arg Trp Thr Glu Ala Glu Asp Ala | |
| 65 70 75 80 | |
| gag gac gat gat gat ctc tac aat caa cat gtt act gag gag cac tac | 288 |
| Glu Asp Asp Asp Asp Leu Tyr Asn Gln His Val Thr Glu Glu His Tyr | |
| 85 90 95 | |
| cga tca atg ctt ggg gag cat gta caa aaa ttc aaa aat agg tcc aag | 336 |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Arg | Ser | Met | Leu | Gly | Glu | His | Val | Gln | Lys | Phe | Lys | Asn | Arg | Ser | Lys | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| gag | act | caa | ggg | aat | cct | cct | cat | ctg | atg | ggg | ttt | ccg | gtg | cta | aag | 384 |
| Glu | Thr | Gln | Gly | Asn | Pro | Pro | His | Leu | Met | Gly | Phe | Pro | Val | Leu | Lys | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| agc | aat | gtg | ggc | agt | tac | aga | ggg | agg | aaa | cca | ggg | aat | gat | tac | cat | 432 |
| Ser | Asn | Val | Gly | Ser | Tyr | Arg | Gly | Arg | Lys | Pro | Gly | Asn | Asp | Tyr | His | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| ggg | agg | ttc | tat | gac | atg | gac | aac | tct | cca | aat | ttt | gca | gct | gat | gtg | 480 |
| Gly | Arg | Phe | Tyr | Asp | Met | Asp | Asn | Ser | Pro | Asn | Phe | Ala | Ala | Asp | Val | |
| 145 | | | | 150 | | | | | | 155 | | | | | 160 | |
| acc | cca | cat | agg | cga | gga | agc | tac | cat | gat | cgt | gat | att | aca | ccc | aag | 528 |
| Thr | Pro | His | Arg | Arg | Gly | Ser | Tyr | His | Asp | Arg | Asp | Ile | Thr | Pro | Lys | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| ata | gca | tat | gaa | cct | tcg | tat | ttg | gac | att | ggg | gat | ggg | gtc | atc | tac | 576 |
| Ile | Ala | Tyr | Glu | Pro | Ser | Tyr | Leu | Asp | Ile | Gly | Asp | Gly | Val | Ile | Tyr | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| aaa | atc | ccc | cca | agt | tat | gac | aag | ctg | gtg | gca | tca | tta | aac | tta | ccg | 624 |
| Lys | Ile | Pro | Pro | Ser | Tyr | Asp | Lys | Leu | Val | Ala | Ser | Leu | Asn | Leu | Pro | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| agc | ttt | tca | gac | att | cat | gtg | gaa | gaa | ttt | tac | ttg | aaa | gga | act | ctg | 672 |
| Ser | Phe | Ser | Asp | Ile | His | Val | Glu | Glu | Phe | Tyr | Leu | Lys | Gly | Thr | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| gat | ctg | aga | tca | tta | gca | gaa | ctg | atg | gca | agt | gat | aaa | agg | tct | gga | 720 |
| Asp | Leu | Arg | Ser | Leu | Ala | Glu | Leu | Met | Ala | Ser | Asp | Lys | Arg | Ser | Gly | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| gta | aga | agc | cgt | aat | gga | atg | ggg | gag | cct | cga | cct | caa | tat | gaa | tct | 768 |
| Val | Arg | Ser | Arg | Asn | Gly | Met | Gly | Glu | Pro | Arg | Pro | Gln | Tyr | Glu | Ser | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| ctt | caa | gct | aga | atg | aag | gcc | ctg | tca | cct | tca | aac | tcc | acc | cca | aat | 816 |
| Leu | Gln | Ala | Arg | Met | Lys | Ala | Leu | Ser | Pro | Ser | Asn | Ser | Thr | Pro | Asn | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| ttt | agc | ctc | aag | gtg | tca | gaa | gct | gca | atg | aat | tct | gcc | att | cca | gaa | 864 |
| Phe | Ser | Leu | Lys | Val | Ser | Glu | Ala | Ala | Met | Asn | Ser | Ala | Ile | Pro | Glu | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| gga | tct | gct | gga | agt | act | gca | cgg | aca | att | ctg | tct | gag | ggg | ggg | gtt | 912 |
| Gly | Ser | Ala | Gly | Ser | Thr | Ala | Arg | Thr | Ile | Leu | Ser | Glu | Gly | Gly | Val | |
| | | 290 | | | | 295 | | | | | 300 | | | | | |
| tta | cag | gtc | cat | tac | gtg | aag | att | ctg | gag | aag | ggg | gat | aca | tac | gag | 960 |
| Leu | Gln | Val | His | Tyr | Val | Lys | Ile | Leu | Glu | Lys | Gly | Asp | Thr | Tyr | Glu | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| att | gtt | aaa | cga | agt | cta | ccg | aag | aag | ctg | aaa | gca | aag | aat | gat | cct | 1008 |
| Ile | Val | Lys | Arg | Ser | Leu | Pro | Lys | Lys | Leu | Lys | Ala | Lys | Asn | Asp | Pro | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| gca | gtc | att | gag | aaa | aca | gaa | agg | gat | aaa | att | aga | aaa | gcc | tgg | atc | 1056 |
| Ala | Val | Ile | Glu | Lys | Thr | Glu | Arg | Asp | Lys | Ile | Arg | Lys | Ala | Trp | Ile | |

| 340 | 345 | 350 | |
|---|-----|-----|------|
| aat att gtc aga aga gat ata gca aaa cac cat aga att ttc act act Asn Ile Val Arg Arg Asp Ile Ala Lys His His Arg Ile Phe Thr Thr 355 360 365 | | | 1104 |
| ttt cat cgt aaa cta tca att gat gcc aag agg ttt gca gat ggt tgc Phe His Arg Lys Leu Ser Ile Asp Ala Lys Arg Phe Ala Asp Gly Cys 370 375 380 | | | 1152 |
| caa aga gag gtg aga atg aag gtg ggt aga tca tac aaa atc cca aga Gln Arg Glu Val Arg Met Lys Val Gly Arg Ser Tyr Lys Ile Pro Arg 385 390 395 400 | | | 1200 |
| act gca cca att cgc act agg aag ata tcc aga gac atg ctg cta ttc Thr Ala Pro Ile Arg Thr Arg Lys Ile Ser Arg Asp Met Leu Leu Phe 405 410 415 | | | 1248 |
| tgg aag cga tat gac aag cag atg gca gaa gag agg aaa aag caa gaa Trp Lys Arg Tyr Asp Lys Gln Met Ala Glu Glu Arg Lys Lys Gln Glu 420 425 430 | | | 1296 |
| aag gaa gct gca gag gct ttt aaa cgt gaa cag gag cag cga gag tca Lys Glu Ala Ala Glu Ala Phe Lys Arg Glu Gln Glu Gln Arg Glu Ser 435 440 445 | | | 1344 |
| aaa agg cag caa caa agg ctc aat ttc ctt att aaa cag act gag ctt Lys Arg Gln Gln Gln Arg Leu Asn Phe Leu Ile Lys Gln Thr Glu Leu 450 455 460 | | | 1392 |
| tac agt cac ttc atg caa aac aag acc gat tcg aat cct tcc gaa gcc Tyr Ser His Phe Met Gln Asn Lys Thr Asp Ser Asn Pro Ser Glu Ala 465 470 475 480 | | | 1440 |
| tta cca ata ggt gat gaa aat ccg att gac gaa gtg ctc cca gaa act Leu Pro Ile Gly Asp Glu Asn Pro Ile Asp Glu Val Leu Pro Glu Thr 485 490 495 | | | 1488 |
| tca gcg gca gaa cct tct gag gta gag gat cct gaa gag gct gaa ctg Ser Ala Ala Glu Pro Ser Glu Val Glu Asp Pro Glu Glu Ala Glu Leu 500 505 510 | | | 1536 |
| aag gaa aag gtc ttg aga gct gcc caa gat gcg gtg tct aag cag aag Lys Glu Lys Val Leu Arg Ala Ala Gln Asp Ala Val Ser Lys Gln Lys 515 520 525 | | | 1584 |
| caa ata aca gat gca ttt gac act gaa tat atg aag cta cgc caa act Gln Ile Thr Asp Ala Phe Asp Thr Glu Tyr Met Lys Leu Arg Gln Thr 530 535 540 | | | 1632 |
| tct gaa atg gaa ggt cct tta aat gat ata tca gtt tct ggc tcg agc Ser Glu Met Glu Gly Pro Leu Asn Asp Ile Ser Val Ser Gly Ser Ser 545 550 555 560 | | | 1680 |
| aat ata gat ttg cat aac cca tct aca atg cct gtt aca tca aca gtt Asn Ile Asp Leu His Asn Pro Ser Thr Met Pro Val Thr Ser Thr Val 565 570 575 | | | 1728 |
| cag act cca gag tta ttt aaa gga acc ctt aaa gaa tac caa atg aaa Gln Thr Pro Glu Leu Phe Lys Gly Thr Leu Lys Glu Tyr Gln Met Lys 580 585 590 | | | 1776 |

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|---|------|
| ggc ctt cag tgg cta gtc aat tgt tat gag cag ggt ttg aat ggc ata Gly Leu Gln Trp Leu Val Asn Cys Tyr Glu Gln Gly Leu Asn Gly Ile 595 600 605 | 1824 |
| ctt gct gat gaa atg ggc ttg ggt aag act att caa gct atg gcg ttc Leu Ala Asp Glu Met Gly Leu Gly Lys Thr Ile Gln Ala Met Ala Phe 610 615 620 | 1872 |
| ttg gca cat ttg gct gag gaa aag aac att tgg ggt cca ttt ctt gtt Leu Ala His Leu Ala Glu Glu Lys Asn Ile Trp Gly Pro Phe Leu Val 625 630 635 640 | 1920 |
| gtt gcc cct gcc tct gtt ctt aac aat tgg gct gat gaa atc agt cgt Val Ala Pro Ala Ser Val Leu Asn Asn Trp Ala Asp Glu Ile Ser Arg 645 650 655 | 1968 |
| ttc tgt cct gac ttg aaa act ctt cca tat tgg gga gga tta caa gaa Phe Cys Pro Asp Leu Lys Thr Leu Pro Tyr Trp Gly Gly Leu Gln Glu 660 665 670 | 2016 |
| cga aca att tta aga aag aat atc aat ccc aag cgt atg tac cga agg Arg Thr Ile Leu Arg Lys Asn Ile Asn Pro Lys Arg Met Tyr Arg Arg 675 680 685 | 2064 |
| gat gct ggc ttt cat att ttg att act agc tat cag cta tta gtc act Asp Ala Gly Phe His Ile Leu Ile Thr Ser Tyr Gln Leu Leu Val Thr 690 695 700 | 2112 |
| gat gaa aag tat ttt cgc cgg gtg aag tgg caa tat atg gtg cta gat Asp Glu Lys Tyr Phe Arg Arg Val Lys Trp Gln Tyr Met Val Leu Asp 705 710 715 720 | 2160 |
| gag gcc caa gca atc aag agt tcc tcc agt ata aga tgg aaa acc ctt Glu Ala Gln Ala Ile Lys Ser Ser Ser Ser Ile Arg Trp Lys Thr Leu 725 730 735 | 2208 |
| ctt agt ttt aac tgt cgg aac cga ttg ctt ctg act ggt act cca att Leu Ser Phe Asn Cys Arg Asn Arg Leu Leu Leu Thr Gly Thr Pro Ile 740 745 750 | 2256 |
| cag aac aac atg gca gag tta tgg gcc ctg ctg cat ttc atc atg cca Gln Asn Asn Met Ala Glu Leu Trp Ala Leu Leu His Phe Ile Met Pro 755 760 765 | 2304 |
| atg ttg ttt gac aac cat gat caa ttt aat gaa tgg ttc tca aaa gga Met Leu Phe Asp Asn His Asp Gln Phe Asn Glu Trp Phe Ser Lys Gly 770 775 780 | 2352 |
| att gag aat cat gct gaa cac gga ggc act tta aat gag cac cag ctt Ile Glu Asn His Ala Glu His Gly Gly Thr Leu Asn Glu His Gln Leu 785 790 795 800 | 2400 |
| aac aga ctg cat gcg atc ttg aaa ccg ttc atg ctt cga cgg gta aaa Asn Arg Leu His Ala Ile Leu Lys Pro Phe Met Leu Arg Arg Val Lys 805 810 815 | 2448 |
| aag gat gtg gtt tct gag cta act aca aag acg gaa gtt aca gta cac Lys Asp Val Val Ser Glu Leu Thr Thr Lys Thr Glu Val Thr Val His 820 825 830 | 2496 |

| | |
|---|------|
| tgc aag ctc agt tct cga caa caa gct ttt tat cag gct att aag aac | 2544 |
| Cys Lys Leu Ser Ser Arg Gln Gln Ala Phe Tyr Gln Ala Ile Lys Asn | |
| 835 840 845 | |
| aaa att tct ctg gct gag ttg ttt gat agc aac cgc gga caa ttt act | 2592 |
| Lys Ile Ser Leu Ala Glu Leu Phe Asp Ser Asn Arg Gly Gln Phe Thr | |
| 850 855 860 | |
| gat aag aaa gta ttg aat tta atg aat att gtc att caa cta agg aag | 2640 |
| Asp Lys Lys Val Leu Asn Leu Met Asn Ile Val Ile Gln Leu Arg Lys | |
| 865 870 875 880 | |
| gtt tgc aac cat cca gag ttg ttc gaa agg aat gaa ggg agc tcg tat | 2688 |
| Val Cys Asn His Pro Glu Leu Phe Glu Arg Asn Glu Gly Ser Ser Tyr | |
| 885 890 895 | |
| ctc tac ttt gga gtg act tcc aat tct ctt ttg ccc cat ccc ttt ggt | 2736 |
| Leu Tyr Phe Gly Val Thr Ser Asn Ser Leu Leu Pro His Pro Phe Gly | |
| 900 905 910 | |
| gag cta gag gat gta cat tat tct ggt ggt caa aat ccg ata ata tac | 2784 |
| Glu Leu Glu Asp Val His Tyr Ser Gly Gly Gln Asn Pro Ile Ile Tyr | |
| 915 920 925 | |
| aag ata cct aag cta cta cac caa gag gtg ctc caa aat tct gaa aca | 2832 |
| Lys Ile Pro Lys Leu Leu His Gln Glu Val Leu Gln Asn Ser Glu Thr | |
| 930 935 940 | |
| ttt tgt tct tct gtc ggg cgt ggc atc tca aga gaa tct ttt ctg aag | 2880 |
| Phe Cys Ser Ser Val Gly Arg Gly Ile Ser Arg Glu Ser Phe Leu Lys | |
| 945 950 955 960 | |
| cat ttt aat ata tat tca cct gag tat att ctt aag tca ata ttc cca | 2928 |
| His Phe Asn Ile Tyr Ser Pro Glu Tyr Ile Leu Lys Ser Ile Phe Pro | |
| 965 970 975 | |
| tct gat agt ggg gta gat caa gtg gtt agt gga agt gga gca ttt ggc | 2976 |
| Ser Asp Ser Gly Val Asp Gln Val Val Ser Gly Ser Gly Ala Phe Gly | |
| 980 985 990 | |
| ttt tca cgc ttg atg gat cta tca cca tca gaa gtt gga tat ctg gct | 3024 |
| Phe Ser Arg Leu Met Asp Leu Ser Pro Ser Glu Val Gly Tyr Leu Ala | |
| 995 1000 1005 | |
| ctg tgt tct gtt gca gaa agg cta tta ttt tct ata ctg agg tgg gag | 3072 |
| Leu Cys Ser Val Ala Glu Arg Leu Leu Phe Ser Ile Leu Arg Trp Glu | |
| 1010 1015 1020 | |
| cgg caa ttt ttg gat gaa tta gtt aac tct ctt atg gag tcc aag gat | 3120 |
| Arg Gln Phe Leu Asp Glu Leu Val Asn Ser Leu Met Glu Ser Lys Asp | |
| 1025 1030 1035 1040 | |
| ggt gat ctt agt gac aat aac atc gag aga gtt aaa acc aaa gct gtc | 3168 |
| Gly Asp Leu Ser Asp Asn Asn Ile Glu Arg Val Lys Thr Lys Ala Val | |
| 1045 1050 1055 | |
| aca aga atg ttg ctg atg cca tca aaa gtt gaa acg aat ttt cag aaa | 3216 |
| Thr Arg Met Leu Leu Met Pro Ser Lys Val Glu Thr Asn Phe Gln Lys | |
| 1060 1065 1070 | |
| agg aga cta agc aca ggg cct acc cgt cct tca ttt gaa gcg cta gtg | 3264 |

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|---|------|
| Arg Arg Leu Ser Thr Gly Pro Thr Arg Pro Ser Phe Glu Ala Leu Val | |
| 1075 1080 1085 | |
| atc tct cat cag gat agg ttt ctt tca agt atc aaa ctc ctg cat tct | 3312 |
| Ile Ser His Gln Asp Arg Phe Leu Ser Ser Ile Lys Leu Leu His Ser | |
| 1090 1095 1100 | |
| gca tat act tat atc cca aaa gcc aga gct cca cct gta agc att cat | 3360 |
| Ala Tyr Thr Tyr Ile Pro Lys Ala Arg Ala Pro Pro Val Ser Ile His | |
| 1105 1110 1115 1120 | |
| tgc tcg gac aga aat tcg gca tac aga gtt aca gaa gaa tta cat caa | 3408 |
| Cys Ser Asp Arg Asn Ser Ala Tyr Arg Val Thr Glu Glu Leu His Gln | |
| 1125 1130 1135 | |
| cca tgg ctt aag aga cta tta atc ggt ttt gca cga acg tca gaa gct | 3456 |
| Pro Trp Leu Lys Arg Leu Leu Ile Gly Phe Ala Arg Thr Ser Glu Ala | |
| 1140 1145 1150 | |
| aat gga ccc agg aag cct aac agc ttt cca cat cct tta atc caa gaa | 3504 |
| Asn Gly Pro Arg Lys Pro Asn Ser Phe Pro His Pro Leu Ile Gln Glu | |
| 1155 1160 1165 | |
| att gat tca gaa ctt cca gtt gtg cag cct gcg ctt caa ctg aca cac | 3552 |
| Ile Asp Ser Glu Leu Pro Val Val Gln Pro Ala Leu Gln Leu Thr His | |
| 1170 1175 1180 | |
| aga ata ttt ggt tct tgc cct cca atg caa agt ttt gac cca gca aag | 3600 |
| Arg Ile Phe Gly Ser Cys Pro Pro Met Gln Ser Phe Asp Pro Ala Lys | |
| 1185 1190 1195 1200 | |
| ttg ctc acg gac tct ggg aag ctg cag aca ctt gat ata tta ttg aag | 3648 |
| Leu Leu Thr Asp Ser Gly Lys Leu Gln Thr Leu Asp Ile Leu Leu Lys | |
| 1205 1210 1215 | |
| cgg ctt cga gct gga aat cac agg gtg ctc ctg ttt gca caa atg aca | 3696 |
| Arg Leu Arg Ala Gly Asn His Arg Val Leu Phe Ala Gln Met Thr | |
| 1220 1225 1230 | |
| aag atg ctg aac att ctc gag gat tat atg aac tat aga aag tac aag | 3744 |
| Lys Met Leu Asn Ile Leu Glu Asp Tyr Met Asn Tyr Arg Lys Tyr Lys | |
| 1235 1240 1245 | |
| tac ctc agg ctt gat gga tcc tcc acc atc atg gat cgc cga gat atg | 3792 |
| Tyr Leu Arg Leu Asp Gly Ser Ser Thr Ile Met Asp Arg Arg Asp Met | |
| 1250 1255 1260 | |
| gtt agg gat ttt cag cat agg agc gat att ttt gta ttc ttg ctg agc | 3840 |
| Val Arg Asp Phe Gln His Arg Ser Asp Ile Phe Val Phe Leu Leu Ser | |
| 1265 1270 1275 1280 | |
| acc aga gct gga gga ctt ggt atc aac ttg acg gct gca gac act gtc | 3888 |
| Thr Arg Ala Gly Gly Leu Gly Ile Asn Leu Thr Ala Ala Asp Thr Val | |
| 1285 1290 1295 | |
| att ttc tat gaa agt gat tgg aat ccc acc ttg gat tta caa gct atg | 3936 |
| Ile Phe Tyr Glu Ser Asp Trp Asn Pro Thr Leu Asp Leu Gln Ala Met | |
| 1300 1305 1310 | |
| gac agg gct cat cgt ctt gga cag aca aaa gat gtt act gtt tat cgt | 3984 |
| Asp Arg Ala His Arg Leu Gly Gln Thr Lys Asp Val Thr Val Tyr Arg | |

| 1315 | 1320 | 1325 | |
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| ctc atc tgt aag gag acg gtg gaa gag aaa att ttg cac agg gca agt Leu Ile Cys Lys Glu Thr Val Glu Glu Lys Ile Leu His Arg Ala Ser 1330 1335 1340 | | | 4032 |
| cag aaa aat aca gtt caa cag ctt gtt atg act gga ggg cat gtt cag Gln Lys Asn Thr Val Gln Gln Leu Val Met Thr Gly Gly His Val Gln 1345 1350 1355 1360 | | | 4080 |
| ggt gat gat ttt ctt gga gct gcg gat gtg gta tct ctg cta atg gat Gly Asp Asp Phe Leu Gly Ala Ala Asp Val Val Ser Leu Leu Met Asp 1365 1370 1375 | | | 4128 |
| gat gcg gag gca gca caa ctg gag cag aaa ttc aga gaa cta cca tta Asp Ala Glu Ala Ala Gln Leu Glu Gln Lys Phe Arg Glu Leu Pro Leu 1380 1385 1390 | | | 4176 |
| cag gta aag gac agg cag aag aaa aag acg aaa cgt atc aga ata gat Gln Val Lys Asp Arg Gln Lys Lys Lys Thr Lys Arg Ile Arg Ile Asp 1395 1400 1405 | | | 4224 |
| gct gaa gga gat gca act ttg gaa gag tta gaa gat gtt gac cga cag Ala Glu Gly Asp Ala Thr Leu Glu Glu Leu Glu Asp Val Asp Arg Gln 1410 1415 1420 | | | 4272 |
| gat aac gga cag gaa cct ttg gaa gaa ccg gaa aag cca aaa tcc agt Asp Asn Gly Gln Glu Pro Leu Glu Glu Pro Glu Lys Pro Lys Ser Ser 1425 1430 1435 1440 | | | 4320 |
| aat aaa aag agg aga gct gct tca aat ccg aaa gct aga gct cct cag Asn Lys Lys Arg Arg Ala Ala Ser Asn Pro Lys Ala Arg Ala Pro Gln 1445 1450 1455 | | | 4368 |
| aaa gca aag gaa gaa gca aat ggt gaa gat act cct cag agg aca aaa Lys Ala Lys Glu Glu Ala Asn Gly Glu Asp Thr Pro Gln Arg Thr Lys 1460 1465 1470 | | | 4416 |
| agg gta aag aga caa aca aag agc ata aac gaa agt ctt gaa cct gta Arg Val Lys Arg Gln Thr Lys Ser Ile Asn Glu Ser Leu Glu Pro Val 1475 1480 1485 | | | 4464 |
| ttc tct gcc tct gta aca gaa tca aat aaa gga ttc gat cca agt agc Phe Ser Ala Ser Val Thr Glu Ser Asn Lys Gly Phe Asp Pro Ser Ser 1490 1495 1500 | | | 4512 |
| tcc gct aac taa Ser Ala Asn * 1505 | | | 4524 |

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 Phe Asp Leu Glu Pro Leu Met Lys Phe Arg Ile Pro Lys Pro Glu Asp
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| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Val | Asp | Tyr | Tyr | Gly | Ser | Ser | Ser | Gln | Asp | Glu | Ser | Arg | Ser | Thr | 35 | 40 | 45 |
| Gln | Gly | Gly | Val | Val | Ala | Asn | Tyr | Ser | Asn | Gly | Ser | Lys | Ser | Arg | Met | 50 | 55 | 60 |
| Asn | Ala | Ser | Ser | Lys | Lys | Arg | Lys | Arg | Trp | Thr | Glu | Ala | Glu | Asp | Ala | 65 | 70 | 75 |
| Glu | Asp | Asp | Asp | Asp | Leu | Tyr | Asn | Gln | His | Val | Thr | Glu | Glu | His | Tyr | 85 | 90 | 95 |
| Arg | Ser | Met | Leu | Gly | Glu | His | Val | Gln | Lys | Phe | Lys | Asn | Arg | Ser | Lys | 100 | 105 | 110 |
| Glu | Thr | Gln | Gly | Asn | Pro | Pro | His | Leu | Met | Gly | Phe | Pro | Val | Leu | Lys | 115 | 120 | 125 |
| Ser | Asn | Val | Gly | Ser | Tyr | Arg | Gly | Arg | Lys | Pro | Gly | Asn | Asp | Tyr | His | 130 | 135 | 140 |
| Gly | Arg | Phe | Tyr | Asp | Met | Asp | Asn | Ser | Pro | Asn | Phe | Ala | Ala | Asp | Val | 145 | 150 | 155 |
| Thr | Pro | His | Arg | Arg | Gly | Ser | Tyr | His | Asp | Arg | Asp | Ile | Thr | Pro | Lys | 165 | 170 | 175 |
| Ile | Ala | Tyr | Glu | Pro | Ser | Tyr | Leu | Asp | Ile | Gly | Asp | Gly | Val | Ile | Tyr | 180 | 185 | 190 |
| Lys | Ile | Pro | Pro | Ser | Tyr | Asp | Lys | Leu | Val | Ala | Ser | Leu | Asn | Leu | Pro | 195 | 200 | 205 |
| Ser | Phe | Ser | Asp | Ile | His | Val | Glu | Glu | Phe | Tyr | Leu | Lys | Gly | Thr | Leu | 210 | 215 | 220 |
| Asp | Leu | Arg | Ser | Leu | Ala | Glu | Leu | Met | Ala | Ser | Asp | Lys | Arg | Ser | Gly | 225 | 230 | 235 |
| Val | Arg | Ser | Arg | Asn | Gly | Met | Gly | Glu | Pro | Arg | Pro | Gln | Tyr | Glu | Ser | 245 | 250 | 255 |
| Leu | Gln | Ala | Arg | Met | Lys | Ala | Leu | Ser | Pro | Ser | Asn | Ser | Thr | Pro | Asn | 260 | 265 | 270 |
| Phe | Ser | Leu | Lys | Val | Ser | Glu | Ala | Ala | Met | Asn | Ser | Ala | Ile | Pro | Glu | 275 | 280 | 285 |
| Gly | Ser | Ala | Gly | Ser | Thr | Ala | Arg | Thr | Ile | Leu | Ser | Glu | Gly | Gly | Val | 290 | 295 | 300 |
| Leu | Gln | Val | His | Tyr | Val | Lys | Ile | Leu | Glu | Lys | Gly | Asp | Thr | Tyr | Glu | 305 | 310 | 315 |
| Ile | Val | Lys | Arg | Ser | Leu | Pro | Lys | Lys | Leu | Lys | Ala | Lys | Asn | Asp | Pro | 325 | 330 | 335 |
| Ala | Val | Ile | Glu | Lys | Thr | Glu | Arg | Asp | Lys | Ile | Arg | Lys | Ala | Trp | Ile | 340 | 345 | 350 |
| Asn | Ile | Val | Arg | Arg | Asp | Ile | Ala | Lys | His | His | Arg | Ile | Phe | Thr | Thr | 355 | 360 | 365 |
| Phe | His | Arg | Lys | Leu | Ser | Ile | Asp | Ala | Lys | Arg | Phe | Ala | Asp | Gly | Cys | 370 | 375 | 380 |
| Gln | Arg | Glu | Val | Arg | Met | Lys | Val | Gly | Arg | Ser | Tyr | Lys | Ile | Pro | Arg | 385 | 390 | 395 |
| Thr | Ala | Pro | Ile | Arg | Thr | Arg | Lys | Ile | Ser | Arg | Asp | Met | Leu | Leu | Phe | 405 | 410 | 415 |
| Trp | Lys | Arg | Tyr | Asp | Lys | Gln | Met | Ala | Glu | Glu | Arg | Lys | Lys | Gln | Glu | 420 | 425 | 430 |
| Lys | Glu | Ala | Ala | Glu | Ala | Phe | Lys | Arg | Glu | Gln | Glu | Gln | Arg | Glu | Ser | 435 | 440 | 445 |
| Lys | Arg | Gln | Gln | Gln | Arg | Leu | Asn | Phe | Leu | Ile | Lys | Gln | Thr | Glu | Leu | 450 | 455 | 460 |
| Tyr | Ser | His | Phe | Met | Gln | Asn | Lys | Thr | Asp | Ser | Asn | Pro | Ser | Glu | Ala | 465 | 470 | 475 |
| Leu | Pro | Ile | Gly | Asp | Glu | Asn | Pro | Ile | Asp | Glu | Val | Leu | Pro | Glu | Thr | 485 | 490 | 495 |
| Ser | Ala | Ala | Glu | Pro | Ser | Glu | Val | Glu | Asp | Pro | Glu | Glu | Ala | Glu | Leu | 500 | 505 | 510 |
| Lys | Glu | Lys | Val | Leu | Arg | Ala | Ala | Gln | Asp | Ala | Val | Ser | Lys | Gln | Lys | | | |

| | | | | | | | | | | | | | | | |
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| Leu | Ala | Asp | Glu | Met | Gly | Leu | Gly | Lys | Thr | Ile | Gln | Ala | Met | Ala | Phe |
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| 885 | | | | | 890 | | | | | 895 | | | | | |
| Leu | Tyr | Phe | Gly | Val | Thr | Ser | Asn | Ser | Leu | Leu | Pro | His | Pro | Phe | Gly |
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| Phe | Ser | Arg | Leu | Met | Asp | Leu | Ser | Pro | Ser | Glu | Val | Gly | Tyr | Leu | Ala |
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| Pro Ile Asp Leu Leu Asp Arg Leu Val Ile Ile Arg Thr Gln Ile Tyr | |
| 355 360 365 | |
| gat ccc tct gaa atg atc cag att ata gcc att cgt gcg caa gtt gaa | 1152 |
| Asp Pro Ser Glu Met Ile Gln Ile Ile Ala Ile Arg Ala Gln Val Glu | |
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| gaa tta acc gtg gat gaa gaa tgc ttg gtt cta ctt ggg gag att ggg | 1200 |
| Glu Leu Thr Val Asp Glu Glu Cys Leu Val Leu Leu Gly Glu Ile Gly | |
| 385 390 395 400 | |
| caa aga act tca cta agg cac gct gtg cag ctt ctg tct cct gcc agc | 1248 |
| Gln Arg Thr Ser Leu Arg His Ala Val Gln Leu Leu Ser Pro Ala Ser | |
| 405 410 415 | |
| att gta gcg aaa atg aat ggc cgt gac aat att tgc aag gct gat ata | 1296 |
| Ile Val Ala Lys Met Asn Gly Arg Asp Asn Ile Cys Lys Ala Asp Ile | |
| 420 425 430 | |
| gag gaa gta aca tca ctc tac ttg gat gct aaa tct tca gca aag ctt | 1344 |
| Glu Glu Val Thr Ser Leu Tyr Leu Asp Ala Lys Ser Ser Ala Lys Leu | |
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| ttg cat gag caa caa gaa aaa tac atc tca tga | 1377 |
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| Arg Glu Ala Ala Gly Leu Val Val Asp Met Ile Lys Gln Lys Lys Met | |
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| Ala Leu Ala Leu Gly Ile Ser Gln Glu Leu Gly Ser Lys Val Pro Phe | |
| 85 90 95 | |
| Cys Pro Met Val Gly Ser Glu Val Tyr Ser Ser Glu Val Lys Lys Thr | |
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| Glu Val Leu Met Glu Asn Phe Arg Arg Ala Ile Gly Leu Arg Ile Lys | |
| 115 120 125 | |
| Glu Thr Lys Glu Val Tyr Glu Gly Glu Val Thr Glu Leu Ser Pro Glu | |
| 130 135 140 | |

| | | | | | | | | | | | | | | | |
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| Val | Ile | Thr | Leu | Lys | Thr | Val | Lys | Gly | Thr | Lys | His | Leu | Lys | Leu | Asp |
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| Pro | Thr | Ile | Tyr | Asp | Ala | Leu | Ile | Lys | Glu | Lys | Val | Ala | Val | Gly | Asp |
| | | | 180 | | | | | 185 | | | | | 190 | | |
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| Ser | Asp | Ala | Phe | Ala | Thr | Glu | Phe | Asp | Leu | Glu | Ala | Glu | Glu | Tyr | Val |
| | 210 | | | | 215 | | | | | | 220 | | | | |
| Pro | Leu | Pro | Lys | Gly | Glu | Val | His | Lys | Lys | Lys | Glu | Ile | Val | Gln | Asp |
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| Val | Thr | Leu | Gln | Asp | Leu | Asp | Ala | Ala | Asn | Ala | Arg | Pro | Gln | Gly | Gly |
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| Gln | Asp | Ile | Leu | Ser | Leu | Met | Gly | Gln | Met | Met | Lys | Pro | Arg | Lys | Thr |
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| Glu | Ile | Thr | Asp | Lys | Leu | Arg | Gln | Glu | Ile | Asn | Lys | Val | Val | Asn | Arg |
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| Tyr | Ile | Asp | Glu | Gly | Val | Ala | Glu | Leu | Val | Pro | Gly | Val | Leu | Phe | Ile |
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| Ala | Leu | Glu | Ser | Ser | Leu | Ser | Pro | Ile | Val | Ile | Phe | Ala | Thr | Asn | Arg |
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| Gly | Val | Cys | Asn | Val | Arg | Gly | Thr | Asp | Met | Pro | Ser | Pro | His | Gly | Val |
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| Glu | Leu | Thr | Val | Asp | Glu | Glu | Cys | Leu | Val | Leu | Leu | Gly | Glu | Ile | Gly |
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| Gln | Arg | Thr | Ser | Leu | Arg | His | Ala | Val | Gln | Leu | Leu | Ser | Pro | Ala | Ser |
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| Ile | Val | Ala | Lys | Met | Asn | Gly | Arg | Asp | Asn | Ile | Cys | Lys | Ala | Asp | Ile |
| | | 420 | | | | | 425 | | | | | | 430 | | |
| Glu | Glu | Val | Thr | Ser | Leu | Tyr | Leu | Asp | Ala | Lys | Ser | Ser | Ala | Lys | Leu |
| | | 435 | | | | 440 | | | | | | 445 | | | |
| Leu | His | Glu | Gln | Gln | Glu | Lys | Tyr | Ile | Ser | | | | | | |
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| Met | Ala | Glu | Leu | Lys | Leu | Ser | Glu | Ser | Arg | Asp | Leu | Thr | Arg | Val | Glu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | | |
| cga | atc | ggc | gca | cac | tca | cac | atc | aga | gga | cta | ggt | ctc | gac | tct | gcc | 96 |
| Arg | Ile | Gly | Ala | His | Ser | His | Ile | Arg | Gly | Leu | Gly | Leu | Asp | Ser | Ala | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |

| | |
|--|-----|
| ctc gag ccg cga gct gtt tcc gaa ggt atg gtc ggt caa gtg aag gcg | 144 |
| Leu Glu Pro Arg Ala Val Ser Glu Gly Met Val Gly Gln Val Lys Ala | |
| 35 40 45 | |
| cggt aaa gcc gcc ggt gta atc ctt cag atg att aga gaa ggg aaa atc | 192 |
| Arg Lys Ala Ala Gly Val Ile Leu Gln Met Ile Arg Glu Gly Lys Ile | |
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| gcg ggt ccg gct att cta ata gcg ggt caa ccc gga acg ggt aag aca | 240 |
| Ala Gly Arg Ala Ile Leu Ile Ala Gly Gln Pro Gly Thr Gly Lys Thr | |
| 65 70 75 80 | |
| gcg att gca atg ggt atg gcg aaa tct ctt ggc ttg gaa act cct ttt | 288 |
| Ala Ile Ala Met Gly Met Ala Lys Ser Leu Gly Leu Glu Thr Pro Phe | |
| 85 90 95 | |
| gcg atg att gca gga agt gaa att ttc tca tta gag atg tca aag aca | 336 |
| Ala Met Ile Ala Gly Ser Glu Ile Phe Ser Leu Glu Met Ser Lys Thr | |
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| gaa gct ttg act cag tct ttt cgt aaa gcg att ggt gtt agg atc aaa | 384 |
| Glu Ala Leu Thr Gln Ser Phe Arg Lys Ala Ile Gly Val Arg Ile Lys | |
| 115 120 125 | |
| gaa gag aca gag gtt att gaa gga gaa gtt gtt gag gtt cag att gat | 432 |
| Glu Glu Thr Glu Val Ile Glu Gly Glu Val Val Glu Val Gln Ile Asp | |
| 130 135 140 | |
| agg cct gct tct tct ggt gtt gct tcc aag tca ggg aag atg act atg | 480 |
| Arg Pro Ala Ser Ser Gly Val Ala Ser Lys Ser Gly Lys Met Thr Met | |
| 145 150 155 160 | |
| aaa acg act gat atg gaa act gtg tat gat atg gga gct aag atg att | 528 |
| Lys Thr Thr Asp Met Glu Thr Val Tyr Asp Met Gly Ala Lys Met Ile | |
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| gag gct ttg aac aag gag aaa gtg cag agt ggt gat gtt att gcc att | 576 |
| Glu Ala Leu Asn Lys Glu Lys Val Gln Ser Gly Asp Val Ile Ala Ile | |
| 180 185 190 | |
| gat aaa gct act ggg aag att act aag ctt gga aga tcg ttt tcg agg | 624 |
| Asp Lys Ala Thr Gly Lys Ile Thr Lys Leu Gly Arg Ser Phe Ser Arg | |
| 195 200 205 | |
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| Ser Arg Asp Tyr Asp Ala Met Gly Ala Gln Thr Lys Phe Val Gln Cys | |
| 210 215 220 | |
| cct gaa ggt gag ttg cag aag agg aaa gag gtt gta cat tgt gtc act | 720 |
| Pro Glu Gly Glu Leu Gln Lys Arg Lys Glu Val Val His Cys Val Thr | |
| 225 230 235 240 | |
| ctt cac gag att gat gtt atc aac agc agg aca caa ggg ttt ctt gcc | 768 |
| Leu His Glu Ile Asp Val Ile Asn Ser Arg Thr Gln Gly Phe Leu Ala | |
| 245 250 255 | |
| ctt ttc act ggc gat act gga gaa atc cga tca gaa gtc cgg gaa caa | 816 |
| Leu Phe Thr Gly Asp Thr Gly Glu Ile Arg Ser Glu Val Arg Glu Gln | |
| 260 265 270 | |
| att gat aca aaa gta gct gaa tgg aga gaa gaa gga aaa gca gag ata | 864 |

| | | | | | | | | | | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|------|--|
| Ile | Asp | Thr | Lys | Val | Ala | Glu | Trp | Arg | Glu | Glu | Gly | Lys | Ala | Glu | Ile | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| ggt | ccc | gga | ggt | ctc | ttc | att | gat | gaa | gtc | cac | atg | ctc | gac | atc | gaa | 912 | |
| Val | Pro | Gly | Val | Leu | Phe | Ile | Asp | Glu | Val | His | Met | Leu | Asp | Ile | Glu | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| tgc | ttc | tca | ttc | ctt | aac | cga | gct | cta | gaa | aac | gaa | atg | tca | cca | atc | 960 | |
| Cys | Phe | Ser | Phe | Leu | Asn | Arg | Ala | Leu | Glu | Asn | Glu | Met | Ser | Pro | Ile | | |
| | 305 | | | | 310 | | | | | 315 | | | | | 320 | | |
| ctt | gtg | gtg | gca | aca | aac | cga | gga | gtg | acg | aca | atc | cgt | ggc | aca | aac | 1008 | |
| Leu | Val | Val | Ala | Thr | Asn | Arg | Gly | Val | Thr | Thr | Ile | Arg | Gly | Thr | Asn | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | |
| cag | aaa | tca | cca | cac | ggg | atc | ccg | att | gat | ctc | ctt | gac | cgt | ctt | ctc | 1056 | |
| Gln | Lys | Ser | Pro | His | Gly | Ile | Pro | Ile | Asp | Leu | Leu | Asp | Arg | Leu | Leu | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | |
| atc | atc | act | acc | caa | cct | tac | aca | gac | gat | gac | ata | agg | aag | ata | tta | 1104 | |
| Ile | Ile | Thr | Thr | Gln | Pro | Tyr | Thr | Asp | Asp | Asp | Ile | Arg | Lys | Ile | Leu | | |
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| gaa | atc | cgt | tgc | caa | gag | gaa | gac | gtt | gag | atg | aac | gaa | gag | gcc | aaa | 1152 | |
| Glu | Ile | Arg | Cys | Gln | Glu | Glu | Asp | Val | Glu | Met | Asn | Glu | Glu | Ala | Lys | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | |
| cag | ctt | ttg | aca | ttg | atc | gga | cgt | gat | aca | tct | cta | agg | tat | gcg | att | 1200 | |
| Gln | Leu | Leu | Thr | Leu | Ile | Gly | Arg | Asp | Thr | Ser | Leu | Arg | Tyr | Ala | Ile | | |
| | 385 | | | | 390 | | | | | 395 | | | | | 400 | | |
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| His | Leu | Ile | Thr | Ala | Ala | Ala | Leu | Ser | Cys | Gln | Lys | Arg | Lys | Gly | Lys | | |
| | | | | 405 | | | | | 410 | | | | | 415 | | | |
| gtc | gtg | gag | gtt | gag | gat | att | cag | aga | gtt | tac | aga | ctg | ttc | ttg | gat | 1296 | |
| Val | Val | Glu | Val | Glu | Asp | Ile | Gln | Arg | Val | Tyr | Arg | Leu | Phe | Leu | Asp | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | |
| gtg | agg | aga | tcg | atg | cag | tat | ctt | gtt | gag | tat | cag | agt | cag | tat | atg | 1344 | |
| Val | Arg | Arg | Ser | Met | Gln | Tyr | Leu | Val | Glu | Tyr | Gln | Ser | Gln | Tyr | Met | | |
| | | 435 | | | | | 440 | | | | | 445 | | | | | |
| ttc | agt | gaa | cca | atc | aaa | aac | gat | gaa | gct | gct | gca | gaa | gac | gaa | caa | 1392 | |
| Phe | Ser | Glu | Pro | Ile | Lys | Asn | Asp | Glu | Ala | Ala | Ala | Glu | Asp | Glu | Gln | | |
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| gat | gct | atg | cag | atc | tga | ggatccacct | ctgtttgcct | tatttatcat | | | | | | | | 1440 | |
| Asp | Ala | Met | Gln | Ile | * | | | | | | | | | | | | |
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| gtttcgtggt | gatatgtatg | attaggatgt | tgaactcgga | tttatgtttt | ttttttttta | 1500 | | | | | | | | | | | |
| agttgtgacg | agattcgggt | ctagaaaatg | atttaaccaa | gttcaataca | gatcggtttg | 1560 | | | | | | | | | | | |
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| Met | Ala | Glu | Leu | Lys | Leu | Ser | Glu | Ser | Arg | Asp | Leu | Thr | Arg | Val | Glu | 1 | 5 | 10 | 15 |
| Arg | Ile | Gly | Ala | His | Ser | His | Ile | Arg | Gly | Leu | Gly | Leu | Asp | Ser | Ala | 20 | 25 | 30 | |
| Leu | Glu | Pro | Arg | Ala | Val | Ser | Glu | Gly | Met | Val | Gly | Gln | Val | Lys | Ala | 35 | 40 | 45 | |
| Arg | Lys | Ala | Ala | Gly | Val | Ile | Leu | Gln | Met | Ile | Arg | Glu | Gly | Lys | Ile | 50 | 55 | 60 | |
| Ala | Gly | Arg | Ala | Ile | Leu | Ile | Ala | Gly | Gln | Pro | Gly | Thr | Gly | Lys | Thr | 65 | 70 | 75 | 80 |
| Ala | Ile | Ala | Met | Gly | Met | Ala | Lys | Ser | Leu | Gly | Leu | Glu | Thr | Pro | Phe | 85 | 90 | 95 | |
| Ala | Met | Ile | Ala | Gly | Ser | Glu | Ile | Phe | Ser | Leu | Glu | Met | Ser | Lys | Thr | 100 | 105 | 110 | |
| Glu | Ala | Leu | Thr | Gln | Ser | Phe | Arg | Lys | Ala | Ile | Gly | Val | Arg | Ile | Lys | 115 | 120 | 125 | |
| Glu | Glu | Thr | Glu | Val | Ile | Glu | Gly | Glu | Val | Val | Glu | Val | Gln | Ile | Asp | 130 | 135 | 140 | |
| Arg | Pro | Ala | Ser | Ser | Gly | Val | Ala | Ser | Lys | Ser | Gly | Lys | Met | Thr | Met | 145 | 150 | 155 | 160 |
| Lys | Thr | Thr | Asp | Met | Glu | Thr | Val | Tyr | Asp | Met | Gly | Ala | Lys | Met | Ile | 165 | 170 | 175 | |
| Glu | Ala | Leu | Asn | Lys | Glu | Lys | Val | Gln | Ser | Gly | Asp | Val | Ile | Ala | Ile | 180 | 185 | 190 | |
| Asp | Lys | Ala | Thr | Gly | Lys | Ile | Thr | Lys | Leu | Gly | Arg | Ser | Phe | Ser | Arg | 195 | 200 | 205 | |
| Ser | Arg | Asp | Tyr | Asp | Ala | Met | Gly | Ala | Gln | Thr | Lys | Phe | Val | Gln | Cys | 210 | 215 | 220 | |
| Pro | Glu | Gly | Glu | Leu | Gln | Lys | Arg | Lys | Glu | Val | Val | His | Cys | Val | Thr | 225 | 230 | 235 | 240 |
| Leu | His | Glu | Ile | Asp | Val | Ile | Asn | Ser | Arg | Thr | Gln | Gly | Phe | Leu | Ala | 245 | 250 | 255 | |
| Leu | Phe | Thr | Gly | Asp | Thr | Gly | Glu | Ile | Arg | Ser | Glu | Val | Arg | Glu | Gln | 260 | 265 | 270 | |
| Ile | Asp | Thr | Lys | Val | Ala | Glu | Trp | Arg | Glu | Glu | Gly | Lys | Ala | Glu | Ile | 275 | 280 | 285 | |
| Val | Pro | Gly | Val | Leu | Phe | Ile | Asp | Glu | Val | His | Met | Leu | Asp | Ile | Glu | 290 | 295 | 300 | |
| Cys | Phe | Ser | Phe | Leu | Asn | Arg | Ala | Leu | Glu | Asn | Glu | Met | Ser | Pro | Ile | 305 | 310 | 315 | 320 |
| Leu | Val | Val | Ala | Thr | Asn | Arg | Gly | Val | Thr | Thr | Ile | Arg | Gly | Thr | Asn | 325 | 330 | 335 | |
| Gln | Lys | Ser | Pro | His | Gly | Ile | Pro | Ile | Asp | Leu | Leu | Asp | Arg | Leu | Leu | 340 | 345 | 350 | |
| Ile | Ile | Thr | Thr | Gln | Pro | Tyr | Thr | Asp | Asp | Asp | Ile | Arg | Lys | Ile | Leu | 355 | 360 | 365 | |
| Glu | Ile | Arg | Cys | Gln | Glu | Glu | Asp | Val | Glu | Met | Asn | Glu | Glu | Ala | Lys | 370 | 375 | 380 | |
| Gln | Leu | Leu | Thr | Leu | Ile | Gly | Arg | Asp | Thr | Ser | Leu | Arg | Tyr | Ala | Ile | 385 | 390 | 395 | 400 |
| His | Leu | Ile | Thr | Ala | Ala | Ala | Leu | Ser | Cys | Gln | Lys | Arg | Lys | Gly | Lys | 405 | 410 | 415 | |
| Val | Val | Glu | Val | Glu | Asp | Ile | Gln | Arg | Val | Tyr | Arg | Leu | Phe | Leu | Asp | 420 | 425 | 430 | |
| Val | Arg | Arg | Ser | Met | Gln | Tyr | Leu | Val | Glu | Tyr | Gln | Ser | Gln | Tyr | Met | 435 | 440 | 445 | |
| Phe | Ser | Glu | Pro | Ile | Lys | Asn | Asp | Glu | Ala | Ala | Ala | Glu | Asp | Glu | Gln | 450 | 455 | 460 | |
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 Ser His Ile Arg Gly Leu Gly Leu Asp Ser Val Leu Glu Pro Arg
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 Ala Val Ser Glu Gly Met Val Gly Gln Ile Lys Ala Arg Lys Ala Ala
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 gga gta acc ctc gag ttg atc aga gac ggc aaa atc tcg ggt cgg gct 204
 Gly Val Thr Leu Glu Leu Ile Arg Asp Gly Lys Ile Ser Gly Arg Ala
 35 40 45

 ata ctt ata gcg ggt caa ccc gga acg ggt aaa atc gca ata gca atg 252
 Ile Leu Ile Ala Gly Gln Pro Gly Thr Gly Lys Ile Ala Ile Ala Met
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 Gly Ile Ala Lys Ser Leu Gly Gln Glu Thr Pro Phe Thr Met Ile Ala
 65 70 75

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 Gly Ser Glu Ile Phe Ser Leu Glu Met Ser Lys Thr Glu Ala Leu Thr
 80 85 90 95

 caa gct ttt cgt aaa gct att ggt gtt agg atc aaa gaa gag act gac 396
 Gln Ala Phe Arg Lys Ala Ile Gly Val Arg Ile Lys Glu Glu Thr Asp
 100 105 110

 gtg ata gaa gga gaa gtt gtg acg att tcg att gat aga cct gct tct 444
 Val Ile Glu Gly Glu Val Val Thr Ile Ser Ile Asp Arg Pro Ala Ser
 115 120 125

 tct ggt ggt tct gtg aag aag act ggg aag ata aca atg aag acg act 492
 Ser Gly Gly Ser Val Lys Lys Thr Gly Lys Ile Thr Met Lys Thr Thr
 130 135 140

 gat atg gaa tct aat ttt gat ttg gga tgg aaa ttg att gag cca ttg 540
 Asp Met Glu Ser Asn Phe Asp Leu Gly Trp Lys Leu Ile Glu Pro Leu
 145 150 155

 gat aag gag aaa gta cag agt ggt gat gtt att gtt ttg gat agg ttt 588
 Asp Lys Glu Lys Val Gln Ser Gly Asp Val Ile Val Leu Asp Arg Phe
 160 165 170 175

 tgt ggg aag att act aag ctt gga aga tct ttt acg agg tct aga gat 636
 Cys Gly Lys Ile Thr Lys Leu Gly Arg Ser Phe Thr Arg Ser Arg Asp
 180 185 190

| | |
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| ttt gat gtt atg ggt tca aag act aag ttt gtg cag tgc cct gaa ggt | 684 |
| Phe Asp Val Met Gly Ser Lys Thr Lys Phe Val Gln Cys Pro Glu Gly | |
| 195 200 205 | |
| gag ctt gag aag agg aag gag gtt ttg cat tct gtc aca ctt cat gag | 732 |
| Glu Leu Glu Lys Arg Lys Glu Val Leu His Ser Val Thr Leu His Glu | |
| 210 215 220 | |
| att gat gtt att aat agc agg act caa ggg tat cta gcc ctc ttc aca | 780 |
| Ile Asp Val Ile Asn Ser Arg Thr Gln Gly Tyr Leu Ala Leu Phe Thr | |
| 225 230 235 | |
| ggg gat aca ggc gag att cgt tca gaa acc cga gag caa agc gat act | 828 |
| Gly Asp Thr Gly Glu Ile Arg Ser Glu Thr Arg Glu Gln Ser Asp Thr | |
| 240 245 250 255 | |
| aaa gtg gca gag tgg aga gaa gaa ggg aaa gct gaa ata gta cct ggt | 876 |
| Lys Val Ala Glu Trp Arg Glu Glu Gly Lys Ala Glu Ile Val Pro Gly | |
| 260 265 270 | |
| gtt ctc ttc att gat gaa gtc cat atg ctt gat atc gaa tgc ttc tct | 924 |
| Val Leu Phe Ile Asp Glu Val His Met Leu Asp Ile Glu Cys Phe Ser | |
| 275 280 285 | |
| ttc ctg aat aga gct ctc gaa aac gat atg tca cca atc ctg gtc gtg | 972 |
| Phe Leu Asn Arg Ala Leu Glu Asn Asp Met Ser Pro Ile Leu Val Val | |
| 290 295 300 | |
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| Ala Thr Asn Arg Gly Met Thr Thr Ile Arg Gly Thr Asn Gln Ile Ser | |
| 305 310 315 | |
| gca cat ggg atc cca atc gat ttt ctt gac cgt ctt ctt att atc aca | 1068 |
| Ala His Gly Ile Pro Ile Asp Phe Leu Asp Arg Leu Leu Ile Ile Thr | |
| 320 325 330 335 | |
| aca cag cct tac aca caa gac gag atc aga aat att tta gag atc cgt | 1116 |
| Thr Gln Pro Tyr Thr Gln Asp Glu Ile Arg Asn Ile Leu Glu Ile Arg | |
| 340 345 350 | |
| tgc caa gaa gag gat gtg gag atg aac gag gaa gcg aaa cag ctt ctg | 1164 |
| Cys Gln Glu Glu Asp Val Glu Met Asn Glu Glu Ala Lys Gln Leu Leu | |
| 355 360 365 | |
| act ttg atc gga tgt aat acc tcg ctt agg tac gcg att cat cta atc | 1212 |
| Thr Leu Ile Gly Cys Asn Thr Ser Leu Arg Tyr Ala Ile His Leu Ile | |
| 370 375 380 | |
| aat gca gct gcc cta gct tgc ctg aaa cgt aaa ggg aaa gtc gta gag | 1260 |
| Asn Ala Ala Ala Leu Ala Cys Leu Lys Arg Lys Gly Lys Val Val Glu | |
| 385 390 395 | |
| att cag gac att gag aga gtt tat aga ttg ttt tta gac acc aag aga | 1308 |
| Ile Gln Asp Ile Glu Arg Val Tyr Arg Leu Phe Leu Asp Thr Lys Arg | |
| 400 405 410 415 | |
| tcg atg cag tac ttg gtt gag cat gag agc gag tac ttg ttt agc gtg | 1356 |
| Ser Met Gln Tyr Leu Val Glu His Glu Ser Glu Tyr Leu Phe Ser Val | |
| 420 425 430 | |
| cct ata aaa aac aca cag gag gct act gca gga gaagaaacag aacacgaggc | 1409 |

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1422

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 Ala Phe Arg Lys Ala Ile Gly Val Arg Ile Lys Glu Glu Thr Asp Val
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 Ile Glu Gly Glu Val Val Thr Ile Ser Ile Asp Arg Pro Ala Ser Ser
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 Gly Gly Ser Val Lys Lys Thr Gly Lys Ile Thr Met Lys Thr Thr Asp
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 Met Glu Ser Asn Phe Asp Leu Gly Trp Lys Leu Ile Glu Pro Leu Asp
 145 150 155 160
 Lys Glu Lys Val Gln Ser Gly Asp Val Ile Val Leu Asp Arg Phe Cys
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 Gly Lys Ile Thr Lys Leu Gly Arg Ser Phe Thr Arg Ser Arg Asp Phe
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 Asp Val Met Gly Ser Lys Thr Lys Phe Val Gln Cys Pro Glu Gly Glu
 195 200 205
 Leu Glu Lys Arg Lys Glu Val Leu His Ser Val Thr Leu His Glu Ile
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 Asp Val Ile Asn Ser Arg Thr Gln Gly Tyr Leu Ala Leu Phe Thr Gly
 225 230 235 240
 Asp Thr Gly Glu Ile Arg Ser Glu Thr Arg Glu Gln Ser Asp Thr Lys
 245 250 255
 Val Ala Glu Trp Arg Glu Glu Gly Lys Ala Glu Ile Val Pro Gly Val
 260 265 270
 Leu Phe Ile Asp Glu Val His Met Leu Asp Ile Glu Cys Phe Ser Phe
 275 280 285
 Leu Asn Arg Ala Leu Glu Asn Asp Met Ser Pro Ile Leu Val Val Ala
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 Thr Asn Arg Gly Met Thr Thr Ile Arg Gly Thr Asn Gln Ile Ser Ala
 305 310 315 320
 His Gly Ile Pro Ile Asp Phe Leu Asp Arg Leu Leu Ile Ile Thr Thr
 325 330 335
 Gln Pro Tyr Thr Gln Asp Glu Ile Arg Asn Ile Leu Glu Ile Arg Cys
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 Gln Glu Glu Asp Val Glu Met Asn Glu Glu Ala Lys Gln Leu Leu Thr
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 370 375 380
 Ala Ala Ala Leu Ala Cys Leu Lys Arg Lys Gly Lys Val Val Glu Ile
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Gln Asp Ile Glu Arg Val Tyr Arg Leu Phe Leu Asp Thr Lys Arg Ser
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cagatcctga agtctaaaat ccagcttttg aaccagacga acatgggttg ttacgccatg 240
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|---|-----|-----|-----|-----|
| gga gtc gat gct gct ttc agc tac aaa tac aat caa cta cat gga att | | | | 96 |
| Gly Val Asp Ala Ala Phe Ser Tyr Lys Tyr Asn Gln Leu His Gly Ile | 20 | 25 | 30 | |
| tgt aaa aaa gat gga att gtt ctc tgt cct gga ttc acg aca aca cac | | | | 144 |
| Cys Lys Lys Asp Gly Ile Val Leu Cys Pro Gly Phe Thr Thr Thr His | 35 | 40 | 45 | |
| tcc att ccg ttt gtc gac gga gaa cct ata tat aaa gga tcc agc cga | | | | 192 |
| Ser Ile Pro Phe Val Asp Gly Glu Pro Ile Tyr Lys Gly Ser Ser Arg | 50 | 55 | 60 | |
| act aac att ggt gga tat cat gtc act gat tat tta aag cag ctt ctg | | | | 240 |
| Thr Asn Ile Gly Gly Tyr His Val Thr Asp Tyr Leu Lys Gln Leu Leu | 65 | 70 | 75 | 80 |
| tca ctt aag tac cct ttt cat tcg tct agg ttt aca tgg gag aag gcc | | | | 288 |
| Ser Leu Lys Tyr Pro Phe His Ser Ser Arg Phe Thr Trp Glu Lys Ala | 85 | 90 | 95 | |
| gaa gat ttg aaa ttg gaa cac tgt tat atc gca cct gac tat gct tcg | | | | 336 |
| Glu Asp Leu Lys Leu Glu His Cys Tyr Ile Ala Pro Asp Tyr Ala Ser | 100 | 105 | 110 | |
| gaa att cgg tta ttc cag gaa gga aga aaa gaa gct gaa gag aaa aca | | | | 384 |
| Glu Ile Arg Leu Phe Gln Glu Gly Arg Lys Glu Ala Glu Glu Lys Thr | 115 | 120 | 125 | |
| agt tat tgg cag ctt cca tgg ata cct cct ccc acc gaa gtt cct cca | | | | 432 |
| Ser Tyr Trp Gln Leu Pro Trp Ile Pro Pro Pro Thr Glu Val Pro Pro | 130 | 135 | 140 | |
| tca gaa gaa gag att gca agg aag gca gct ata aga gaa aaa caa ggt | | | | 480 |
| Ser Glu Glu Glu Ile Ala Arg Lys Ala Ala Ile Arg Glu Lys Gln Gly | 145 | 150 | 155 | 160 |
| caa agg ctg cga gaa atg gct gaa gca aag aga gtg tcc aag att aat | | | | 528 |
| Gln Arg Leu Arg Glu Met Ala Glu Ala Lys Arg Val Ser Lys Ile Asn | 165 | 170 | 175 | |
| gac atg gag aat caa ctg att agc ttg cgt ttc ctt ttg aag caa gtt | | | | 576 |
| Asp Met Glu Asn Gln Leu Ile Ser Leu Arg Phe Leu Leu Lys Gln Val | 180 | 185 | 190 | |
| gac cag gtt gaa gag gat gat att cca acc ttt ttg tca gac acc ggt | | | | 624 |
| Asp Gln Val Glu Glu Asp Asp Ile Pro Thr Phe Leu Ser Asp Thr Gly | 195 | 200 | 205 | |
| tac gcg tcc agg caa gag cta gag tct act att acg aaa gtg aca cag | | | | 672 |
| Tyr Ala Ser Arg Gln Glu Leu Glu Ser Thr Ile Thr Lys Val Thr Gln | 210 | 215 | 220 | |
| tcg ctt aga aaa gca agg ggt gag ccg aag aat gaa cca gct gag tat | | | | 720 |
| Ser Leu Arg Lys Ala Arg Gly Glu Pro Lys Asn Glu Pro Ala Glu Tyr | 225 | 230 | 235 | 240 |
| gaa gaa aac cct gat tct ctt aat aat gaa aag tat cca ctt atg aat | | | | 768 |
| Glu Glu Asn Pro Asp Ser Leu Asn Asn Glu Lys Tyr Pro Leu Met Asn | 245 | 250 | 255 | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| gtc | ccc | gat | gat | att | ctt | act | cct | gag | cag | ctt | aag | gac | aag | aag | agg | 816 |
| Val | Pro | Asp | Asp | Ile | Leu | Thr | Pro | Glu | Gln | Leu | Lys | Asp | Lys | Lys | Arg | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| caa | atg | ttt | ctt | aaa | aca | aca | gca | gag | ggc | cgg | cta | cga | gct | aga | caa | 864 |
| Gln | Met | Phe | Leu | Lys | Thr | Thr | Ala | Glu | Gly | Arg | Leu | Arg | Ala | Arg | Gln | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| aag | cgt | aat | gag | gag | gaa | ctc | gaa | aaa | gag | aaa | aga | aat | caa | tta | gag | 912 |
| Lys | Arg | Asn | Glu | Glu | Glu | Leu | Glu | Lys | Glu | Lys | Arg | Asn | Gln | Leu | Glu | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| gag | gaa | aga | cgt | cgt | gag | aac | cca | gag | tct | tac | tta | gag | gag | ttg | caa | 960 |
| Glu | Glu | Arg | Arg | Arg | Glu | Asn | Pro | Glu | Ser | Tyr | Leu | Glu | Glu | Leu | Gln | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| gct | cag | tac | aag | gaa | gtg | ttg | gag | aga | gtt | gag | cag | aag | aag | cgt | ctg | 1008 |
| Ala | Gln | Tyr | Lys | Glu | Val | Leu | Glu | Arg | Val | Glu | Gln | Lys | Lys | Arg | Leu | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| aaa | aca | aac | ggg | tcc | agt | aac | ggg | aat | aac | aag | tct | gga | ggg | att | ggg | 1056 |
| Lys | Thr | Asn | Gly | Ser | Ser | Asn | Gly | Asn | Asn | Lys | Ser | Gly | Gly | Ile | Gly | |
| | | | 340 | | | | 345 | | | | | | 350 | | | |
| cga | ggc | gag | cga | ctc | agt | gct | gca | cag | agg | gag | aga | atg | cgt | ctg | ctg | 1104 |
| Arg | Gly | Glu | Arg | Leu | Ser | Ala | Ala | Gln | Arg | Glu | Arg | Met | Arg | Leu | Leu | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |
| acg | aca | gca | gcc | ttt | gat | aga | ggg | aaa | ggc | gag | gat | acg | ttt | ggg | tct | 1152 |
| Thr | Thr | Ala | Ala | Phe | Asp | Arg | Gly | Lys | Gly | Glu | Asp | Thr | Phe | Gly | Ser | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |
| aga | gat | gaa | gat | tgg | cag | ctc | tac | aaa | ctt | atg | agc | aag | gat | aat | gac | 1200 |
| Arg | Asp | Glu | Asp | Trp | Gln | Leu | Tyr | Lys | Leu | Met | Ser | Lys | Asp | Asn | Asp | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | |
| gat | gat | gac | gaa | caa | cct | gat | tca | gac | gag | gca | gag | ttg | gct | cgt | tta | 1248 |
| Asp | Asp | Asp | Glu | Gln | Pro | Asp | Ser | Asp | Glu | Ala | Glu | Leu | Ala | Arg | Leu | |
| | | | | 405 | | | | | 410 | | | | | 415 | | |
| tca | tct | aga | ctt | cag | gaa | att | gat | cca | aca | ttt | gtg | cag | aaa | gta | gaa | 1296 |
| Ser | Ser | Arg | Leu | Gln | Glu | Ile | Asp | Pro | Thr | Phe | Val | Gln | Lys | Val | Glu | |
| | | | 420 | | | | | 425 | | | | | 430 | | | |
| gga | gaa | ttg | agt | cag | aca | tca | ggg | gag | gtg | cca | cgc | gta | cgc | cca | tta | 1344 |
| Gly | Glu | Leu | Ser | Gln | Thr | Ser | Gly | Glu | Val | Pro | Arg | Val | Arg | Pro | Leu | |
| | | 435 | | | | | 440 | | | | | 445 | | | | |
| aca | gag | gaa | gac | tac | aag | ata | gtg | att | ggg | ata | gaa | aga | ttc | cgt | tgc | 1392 |
| Thr | Glu | Glu | Asp | Tyr | Lys | Ile | Val | Ile | Gly | Ile | Glu | Arg | Phe | Arg | Cys | |
| | | 450 | | | | 455 | | | | | 460 | | | | | |
| cca | gag | atc | ctg | ttc | cat | cca | aac | ctt | att | ggg | att | gac | caa | gta | ggc | 1440 |
| Pro | Glu | Ile | Leu | Phe | His | Pro | Asn | Leu | Ile | Gly | Ile | Asp | Gln | Val | Gly | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | |
| tta | gac | gag | atg | gct | ggc | aca | tca | atc | aga | agg | cta | ccg | cac | gac | gag | 1488 |
| Leu | Asp | Glu | Met | Ala | Gly | Thr | Ser | Ile | Arg | Arg | Leu | Pro | His | Asp | Glu | |
| | | | | 485 | | | | | 490 | | | | | 495 | | |

| | |
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| aaa gag tta gag gag agg cta acg agc tcg ata cta atg acg ggc ggg | 1536 |
| Lys Glu Leu Glu Glu Arg Leu Thr Ser Ser Ile Leu Met Thr Gly Gly | |
| 500 505 510 | |
| | |
| tgt agc ctt ctt cca ggg atg aac gag cgg ttg gaa tgt ggg att agg | 1584 |
| Cys Ser Leu Leu Pro Gly Met Asn Glu Arg Leu Glu Cys Gly Ile Arg | |
| 515 520 525 | |
| | |
| atg ata aga cct tgc gga tca ccc att aac gtg gtt aga gct atg gat | 1632 |
| Met Ile Arg Pro Cys Gly Ser Pro Ile Asn Val Val Arg Ala Met Asp | |
| 530 535 540 | |
| | |
| cca gtg ctg gat gca tgg cga gga gca tct gca ttt gct gct aat ttg | 1680 |
| Pro Val Leu Asp Ala Trp Arg Gly Ala Ser Ala Phe Ala Ala Asn Leu | |
| 545 550 555 560 | |
| | |
| aac ttc ttg ggg aat gcc ttt act aag atg gat tac gac gag aaa ggt | 1728 |
| Asn Phe Leu Gly Asn Ala Phe Thr Lys Met Asp Tyr Asp Glu Lys Gly | |
| 565 570 575 | |
| | |
| gaa gat tgg ctt aga aat tat caa att cga tac aac tat ttg tga | 1773 |
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| Cys Lys Lys Asp Gly Ile Val Leu Cys Pro Gly Phe Thr Thr His | |
| 35 40 45 | |
| Ser Ile Pro Phe Val Asp Gly Glu Pro Ile Tyr Lys Gly Ser Ser Arg | |
| 50 55 60 | |
| Thr Asn Ile Gly Gly Tyr His Val Thr Asp Tyr Leu Lys Gln Leu Leu | |
| 65 70 75 80 | |
| Ser Leu Lys Tyr Pro Phe His Ser Ser Arg Phe Thr Trp Glu Lys Ala | |
| 85 90 95 | |
| Glu Asp Leu Lys Leu Glu His Cys Tyr Ile Ala Pro Asp Tyr Ala Ser | |
| 100 105 110 | |
| Glu Ile Arg Leu Phe Gln Glu Gly Arg Lys Glu Ala Glu Glu Lys Thr | |
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| Ser Tyr Trp Gln Leu Pro Trp Ile Pro Pro Pro Thr Glu Val Pro Pro | |
| 130 135 140 | |
| Ser Glu Glu Glu Ile Ala Arg Lys Ala Ala Ile Arg Glu Lys Gln Gly | |
| 145 150 155 160 | |
| Gln Arg Leu Arg Glu Met Ala Glu Ala Lys Arg Val Ser Lys Ile Asn | |
| 165 170 175 | |
| Asp Met Glu Asn Gln Leu Ile Ser Leu Arg Phe Leu Leu Lys Gln Val | |
| 180 185 190 | |
| Asp Gln Val Glu Glu Asp Asp Ile Pro Thr Phe Leu Ser Asp Thr Gly | |
| 195 200 205 | |
| Tyr Ala Ser Arg Gln Glu Leu Glu Ser Thr Ile Thr Lys Val Thr Gln | |
| 210 215 220 | |
| Ser Leu Arg Lys Ala Arg Gly Glu Pro Lys Asn Glu Pro Ala Glu Tyr | |

| | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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| Glu | Glu | Asn | Pro | Asp | Ser | Leu | Asn | Asn | Glu | Lys | Tyr | Pro | Leu |
| | | | | 245 | | | | | 250 | | | | 255 |
| Val | Pro | Asp | Asp | Ile | Leu | Thr | Pro | Glu | Gln | Leu | Lys | Asp | Lys |
| | | | 260 | | | | | 265 | | | | 270 | |
| Gln | Met | Phe | Leu | Lys | Thr | Thr | Ala | Glu | Gly | Arg | Leu | Arg | Ala |
| | | 275 | | | | | 280 | | | | 285 | | |
| Lys | Arg | Asn | Glu | Glu | Glu | Leu | Glu | Lys | Glu | Lys | Arg | Asn | Gln |
| | 290 | | | | | 295 | | | | 300 | | | |
| Glu | Glu | Arg | Arg | Arg | Glu | Asn | Pro | Glu | Ser | Tyr | Leu | Glu | Glu |
| | 305 | | | | 310 | | | | | 315 | | | 320 |
| Ala | Gln | Tyr | Lys | Glu | Val | Leu | Glu | Arg | Val | Glu | Gln | Lys | Lys |
| | | | 325 | | | | | | 330 | | | | 335 |
| Lys | Thr | Asn | Gly | Ser | Ser | Asn | Gly | Asn | Asn | Lys | Ser | Gly | Gly |
| | | 340 | | | | | 345 | | | | | 350 | |
| Arg | Gly | Glu | Arg | Leu | Ser | Ala | Ala | Gln | Arg | Glu | Arg | Met | Arg |
| | 355 | | | | | 360 | | | | | 365 | | |
| Thr | Thr | Ala | Ala | Phe | Asp | Arg | Gly | Lys | Gly | Glu | Asp | Thr | Phe |
| | 370 | | | | 375 | | | | | | 380 | | |
| Arg | Asp | Glu | Asp | Trp | Gln | Leu | Tyr | Lys | Leu | Met | Ser | Lys | Asp |
| | 385 | | | | 390 | | | | | 395 | | | 400 |
| Asp | Asp | Asp | Glu | Gln | Pro | Asp | Ser | Asp | Glu | Ala | Glu | Leu | Ala |
| | | | 405 | | | | | | 410 | | | | 415 |
| Ser | Ser | Arg | Leu | Gln | Glu | Ile | Asp | Pro | Thr | Phe | Val | Gln | Lys |
| | | 420 | | | | | 425 | | | | | 430 | |
| Gly | Glu | Leu | Ser | Gln | Thr | Ser | Gly | Glu | Val | Pro | Arg | Val | Arg |
| | 435 | | | | | 440 | | | | 445 | | | 450 |
| Thr | Glu | Glu | Asp | Tyr | Lys | Ile | Val | Ile | Gly | Ile | Glu | Arg | Phe |
| | 450 | | | | 455 | | | | | 460 | | | |
| Pro | Glu | Ile | Leu | Phe | His | Pro | Asn | Leu | Ile | Gly | Ile | Asp | Gln |
| | 465 | | | | 470 | | | | | 475 | | | 480 |
| Leu | Asp | Glu | Met | Ala | Gly | Thr | Ser | Ile | Arg | Arg | Leu | Pro | His |
| | | | 485 | | | | | | 490 | | | | 495 |
| Lys | Glu | Leu | Glu | Glu | Arg | Leu | Thr | Ser | Ser | Ile | Leu | Met | Thr |
| | | 500 | | | | | 505 | | | | | 510 | |
| Cys | Ser | Leu | Leu | Pro | Gly | Met | Asn | Glu | Arg | Leu | Glu | Cys | Gly |
| | 515 | | | | | 520 | | | | | | 525 | |
| Met | Ile | Arg | Pro | Cys | Gly | Ser | Pro | Ile | Asn | Val | Val | Arg | Ala |
| | 530 | | | | 535 | | | | | 540 | | | 545 |
| Pro | Val | Leu | Asp | Ala | Trp | Arg | Gly | Ala | Ser | Ala | Phe | Ala | Ala |
| | 545 | | | | 550 | | | | 555 | | | | 560 |
| Asn | Phe | Leu | Gly | Asn | Ala | Phe | Thr | Lys | Met | Asp | Tyr | Asp | Glu |
| | | | 565 | | | | | | 570 | | | | 575 |
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| | |
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| tta ttg tct tct tca tcg tct ctt ggt gcg ttt gat cag cta ccg atg | 144 |
| Leu Leu Ser Ser Ser Ser Ser Leu Gly Ala Phe Asp Gln Leu Pro Met | |
| 35 40 45 | |
| gat att cta gtc cag ata ctg atg atg atg gag cca aaa gat gct gtg | 192 |
| Asp Ile Leu Val Gln Ile Leu Met Met Met Glu Pro Lys Asp Ala Val | |
| 50 55 60 | |
| aaa ttg ggc tta acg tgc aaa gcc tgg aaa tgc gta gct agt ggt aat | 240 |
| Lys Leu Gly Leu Thr Cys Lys Ala Trp Lys Cys Val Ala Ser Gly Asn | |
| 65 70 75 80 | |
| cgt ctc tgg ata ttt tat ctc cag tgt tct caa gag cca tgg gac tcc | 288 |
| Arg Leu Trp Ile Phe Tyr Leu Gln Cys Ser Gln Glu Pro Trp Asp Ser | |
| 85 90 95 | |
| att ttc ttc gct gaa act agt ttg cgt tct ggt tat cct ctc cga atg | 336 |
| Ile Phe Phe Ala Glu Thr Ser Leu Arg Ser Gly Tyr Pro Leu Arg Met | |
| 100 105 110 | |
| att tct agt caa tca gga gag ttg tcg ttt atg cac att tat agt cag | 384 |
| Ile Ser Ser Gln Ser Gly Glu Leu Ser Phe Met His Ile Tyr Ser Gln | |
| 115 120 125 | |
| agg gca caa gtt cct ggt tct atc att att gat ggt ggt tct gga tat | 432 |
| Arg Ala Gln Val Pro Gly Ser Ile Ile Ile Asp Gly Gly Ser Gly Tyr | |
| 130 135 140 | |
| tgt aag ttt ggt tgg agc aag tat gcg tct cct tct gga cgt tct gct | 480 |
| Cys Lys Phe Gly Trp Ser Lys Tyr Ala Ser Pro Ser Gly Arg Ser Ala | |
| 145 150 155 160 | |
| act ttt ttg gaa ttt ggt aac att gag tca ccg att tat gct aga ctt | 528 |
| Thr Phe Leu Glu Phe Gly Asn Ile Glu Ser Pro Ile Tyr Ala Arg Leu | |
| 165 170 175 | |
| caa cag ttc ttt gca acc att ttc acc agg atg cag gta aag ccc tct | 576 |
| Gln Gln Phe Phe Ala Thr Ile Phe Thr Arg Met Gln Val Lys Pro Ser | |
| 180 185 190 | |
| atg cag cca ata gtg gta tca cta cct ctc tgc cat ttt gat gat act | 624 |
| Met Gln Pro Ile Val Val Ser Leu Pro Leu Cys His Phe Asp Asp Thr | |
| 195 200 205 | |
| gaa tca gcc aag gca tca agg cgg caa ctt aag act gct att ttc aat | 672 |
| Glu Ser Ala Lys Ala Ser Arg Arg Gln Leu Lys Thr Ala Ile Phe Asn | |
| 210 215 220 | |
| gtc ttg ttt gac atg aac gtc cct gca gtg tgt gca gtt aat cag gct | 720 |
| Val Leu Phe Asp Met Asn Val Pro Ala Val Cys Ala Val Asn Gln Ala | |
| 225 230 235 240 | |
| gtg tta gct cta tat gca gca cgg cgg aca tct gga att gtt gtc aac | 768 |
| Val Leu Ala Leu Tyr Ala Ala Arg Arg Thr Ser Gly Ile Val Val Asn | |
| 245 250 255 | |

| | |
|---|------|
| att ggt ttc caa gtc atc acc att ctt ccg att tta cat ggt aag gtg | 816 |
| Ile Gly Phe Gln Val Ile Thr Ile Leu Pro Ile Leu His Gly Lys Val | |
| 260 265 270 | |
| atg cgc cag gta ggt gta gaa gtc att ggt ttt gga gca ttg aaa ctc | 864 |
| Met Arg Gln Val Gly Val Glu Val Ile Gly Phe Gly Ala Leu Lys Leu | |
| 275 280 285 | |
| acg ggc ttc ctt aag gag aag atg caa gaa aac aac att tcc ttt caa | 912 |
| Thr Gly Phe Leu Lys Glu Lys Met Gln Glu Asn Asn Ile Ser Phe Gln | |
| 290 295 300 | |
| tca ctc tac act gtt cgt act ctt aaa gag aaa ctg tgt tat gtg gct | 960 |
| Ser Leu Tyr Thr Val Arg Thr Leu Lys Glu Lys Leu Cys Tyr Val Ala | |
| 305 310 315 320 | |
| ctt gat tat aaa gct gaa ctt tca aaa gac aca caa gct tca gtg gaa | 1008 |
| Leu Asp Tyr Lys Ala Glu Leu Ser Lys Asp Thr Gln Ala Ser Val Glu | |
| 325 330 335 | |
| gtt tca ggt gaa gga tgg ttt act tta tca aaa gag cgt ttc caa aca | 1056 |
| Val Ser Gly Glu Gly Trp Phe Thr Leu Ser Lys Glu Arg Phe Gln Thr | |
| 340 345 350 | |
| ggg gag ata tta ttc caa cca cgt ctc gct gga atg cgt gca atg agt | 1104 |
| Gly Glu Ile Leu Phe Gln Pro Arg Leu Ala Gly Met Arg Ala Met Ser | |
| 355 360 365 | |
| ctg cac cag gcc gtc tcg ctc tgt atg gac cac tgt gat gca gca gga | 1152 |
| Leu His Gln Ala Val Ser Leu Cys Met Asp His Cys Asp Ala Ala Gly | |
| 370 375 380 | |
| ctt aca ggt gac gat agt tgg ttc aag act gta gta cta act ggg gga | 1200 |
| Leu Thr Gly Asp Asp Ser Trp Phe Lys Thr Val Val Leu Thr Gly Gly | |
| 385 390 395 400 | |
| agc gcg tgt ttg cct gga ctc tca gag agg cta gag aga gaa ctg caa | 1248 |
| Ser Ala Cys Leu Pro Gly Leu Ser Glu Arg Leu Glu Arg Glu Leu Gln | |
| 405 410 415 | |
| gat cac ctt cct tca tct ata agt aac gga atc aga gta ata cct cct | 1296 |
| Asp His Leu Pro Ser Ser Ile Ser Asn Gly Ile Arg Val Ile Pro Pro | |
| 420 425 430 | |
| cct tac ggc gtg gac aca tca tgg cat ggg gca aag ctt att agt aat | 1344 |
| Pro Tyr Gly Val Asp Thr Ser Trp His Gly Ala Lys Leu Ile Ser Asn | |
| 435 440 445 | |
| ttg agc atc ttt cct ggt cct tgg tgt atc aca agg aag cag ttc cgt | 1392 |
| Leu Ser Ile Phe Pro Gly Pro Trp Cys Ile Thr Arg Lys Gln Phe Arg | |
| 450 455 460 | |
| cgc aag tca aga ctc atg tgg tga | 1416 |
| Arg Lys Ser Arg Leu Met Trp * | |
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| Met Glu Ala Leu Val Val Asp Ala Gly Ser Lys Phe Leu Lys Ala Gly | |
| 1 5 10 15 | |
| gca gca att cct gac cag tct cct gca atg ata att ccc tct caa atg | 96 |
| Ala Ala Ile Pro Asp Gln Ser Pro Ala Met Ile Ile Pro Ser Gln Met | |
| 20 25 30 | |
| aaa cga atg gtt gat gat ggg tct tct tca gct gat aac ccc acc act | 144 |
| Lys Arg Met Val Asp Asp Gly Ser Ser Ser Ala Asp Asn Pro Thr Thr | |
| 35 40 45 | |
| gtc ttt gag gat gtc act ctt gat cct att gaa agg ggt ttg att aga | 192 |
| Val Phe Glu Asp Val Thr Leu Asp Pro Ile Glu Arg Gly Leu Ile Arg | |
| 50 55 60 | |
| gat tgg gat gct atg gaa gat ctg ttg cgt tat gtt gtc tac act ggg | 240 |
| Asp Trp Asp Ala Met Glu Asp Leu Leu Arg Tyr Val Val Tyr Thr Gly | |
| 65 70 75 80 | |
| ctt gga tgg gaa gag gga aac gaa ggc aat ata ctt ttt aca gat cca | 288 |
| Leu Gly Trp Glu Glu Gly Asn Glu Gly Asn Ile Leu Phe Thr Asp Pro | |
| 85 90 95 | |
| ctt tgt act cct aag gct att agg gag caa ttg gtg cag ttg atg ttt | 336 |
| Leu Cys Thr Pro Lys Ala Ile Arg Glu Gln Leu Val Gln Leu Met Phe | |
| 100 105 110 | |
| gaa aca ttc aat gtc tct gga ttt tat gca tct gag caa gca gtg ttg | 384 |
| Glu Thr Phe Asn Val Ser Gly Phe Tyr Ala Ser Glu Gln Ala Val Leu | |
| 115 120 125 | |
| tcc ctt tat gct gtt gga cgc atc tcc ggt tgc act gtt gat att ggt | 432 |
| Ser Leu Tyr Ala Val Gly Arg Ile Ser Gly Cys Thr Val Asp Ile Gly | |
| 130 135 140 | |
| cat ggg aag ata gat att gcc cca gtt ctt gaa ggt gca gta caa cac | 480 |
| His Gly Lys Ile Asp Ile Ala Pro Val Leu Glu Gly Ala Val Gln His | |
| 145 150 155 160 | |
| att gcc tcg aaa cgg ttt gag cta ggt gga acc gag cta act aaa tta | 528 |
| Ile Ala Ser Lys Arg Phe Glu Leu Gly Gly Thr Glu Leu Thr Lys Leu | |
| 165 170 175 | |
| ttt gcc caa gag ctt gga aaa acc aac ccg tcg atg aat ctc agc atg | 576 |
| Phe Ala Gln Glu Leu Gly Lys Thr Asn Pro Ser Met Asn Leu Ser Met | |
| 180 185 190 | |

| | |
|---|------|
| tct gat gtt gaa aaa ctc aag gag cag tat gca aac tgt gcc gag gac | 624 |
| Ser Asp Val Glu Lys Leu Lys Glu Gln Tyr Ala Asn Cys Ala Glu Asp | |
| 195 200 205 | |
| | |
| gaa att gct tac aaa aaa acc caa aac tgt gaa atc gag cag cat act | 672 |
| Glu Ile Ala Tyr Lys Lys Thr Gln Asn Cys Glu Ile Glu Gln His Thr | |
| 210 215 220 | |
| | |
| ctt cct gat gga cag gtg ata agc atc ggg cga gag aga tac tcg gtt | 720 |
| Leu Pro Asp Gly Gln Val Ile Ser Ile Gly Arg Glu Arg Tyr Ser Val | |
| 225 230 235 240 | |
| | |
| gga gaa gct ctg ttt cag cca tca ata ctg gga ctg gag gag cat gga | 768 |
| Gly Glu Ala Leu Phe Gln Pro Ser Ile Leu Gly Leu Glu Glu His Gly | |
| 245 250 255 | |
| | |
| atc gtt gag cag ctt gtc cgg att atc tcc aca gtg tca tct gag aac | 816 |
| Ile Val Glu Gln Leu Val Arg Ile Ile Ser Thr Val Ser Ser Glu Asn | |
| 260 265 270 | |
| | |
| cat agg cag ctc ttg gag aac act gta ctt tgt ggt ggt aca acc tcc | 864 |
| His Arg Gln Leu Leu Glu Asn Thr Val Leu Cys Gly Gly Thr Thr Ser | |
| 275 280 285 | |
| | |
| atg aca gga ttc gaa agt aga ttc cag aaa gaa gca aac ttg tgc tca | 912 |
| Met Thr Gly Phe Glu Ser Arg Phe Gln Lys Glu Ala Asn Leu Cys Ser | |
| 290 295 300 | |
| | |
| tct gcc att agg cca aca ctg gtg aaa ccg cca gaa tat atg ccg gag | 960 |
| Ser Ala Ile Arg Pro Thr Leu Val Lys Pro Pro Glu Tyr Met Pro Glu | |
| 305 310 315 320 | |
| | |
| aat ttg ggg atg tat tcg gct tgg gtt gga gga gcc ata cta gct aaa | 1008 |
| Asn Leu Gly Met Tyr Ser Ala Trp Val Gly Gly Ala Ile Leu Ala Lys | |
| 325 330 335 | |
| | |
| gtg gtg ttt ccg cag aat cag cac gtt act aaa gca gat tat gac gag | 1056 |
| Val Val Phe Pro Gln Asn Gln His Val Thr Lys Ala Asp Tyr Asp Glu | |
| 340 345 350 | |
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| act gga cca tca gtg gtt cac agg aaa tgt ttc tga | 1092 |
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| 20 25 30 | |
| Lys Arg Met Val Asp Asp Gly Ser Ser Ser Ala Asp Asn Pro Thr Thr | |
| 35 40 45 | |
| Val Phe Glu Asp Val Thr Leu Asp Pro Ile Glu Arg Gly Leu Ile Arg | |
| 50 55 60 | |
| Asp Trp Asp Ala Met Glu Asp Leu Leu Arg Tyr Val Val Tyr Thr Gly | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Gly | Trp | Glu | Glu | Gly | Asn | Glu | Gly | Asn | Ile | Leu | Phe | Thr | Asp | Pro |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Leu | Cys | Thr | Pro | Lys | Ala | Ile | Arg | Glu | Gln | Leu | Val | Gln | Leu | Met | Phe |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Glu | Thr | Phe | Asn | Val | Ser | Gly | Phe | Tyr | Ala | Ser | Glu | Gln | Ala | Val | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ser | Leu | Tyr | Ala | Val | Gly | Arg | Ile | Ser | Gly | Cys | Thr | Val | Asp | Ile | Gly |
| | 130 | | | | 135 | | | | | | 140 | | | | |
| His | Gly | Lys | Ile | Asp | Ile | Ala | Pro | Val | Leu | Glu | Gly | Ala | Val | Gln | His |
| 145 | | | | 150 | | | | | | 155 | | | | 160 | |
| Ile | Ala | Ser | Lys | Arg | Phe | Glu | Leu | Gly | Gly | Thr | Glu | Leu | Thr | Lys | Leu |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Phe | Ala | Gln | Glu | Leu | Gly | Lys | Thr | Asn | Pro | Ser | Met | Asn | Leu | Ser | Met |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ser | Asp | Val | Glu | Lys | Leu | Lys | Glu | Gln | Tyr | Ala | Asn | Cys | Ala | Glu | Asp |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Glu | Ile | Ala | Tyr | Lys | Lys | Thr | Gln | Asn | Cys | Glu | Ile | Glu | Gln | His | Thr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Pro | Asp | Gly | Gln | Val | Ile | Ser | Ile | Gly | Arg | Glu | Arg | Tyr | Ser | Val |
| 225 | | | | 230 | | | | | | 235 | | | | | 240 |
| Gly | Glu | Ala | Leu | Phe | Gln | Pro | Ser | Ile | Leu | Gly | Leu | Glu | Glu | His | Gly |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Ile | Val | Glu | Gln | Leu | Val | Arg | Ile | Ile | Ser | Thr | Val | Ser | Ser | Glu | Asn |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| His | Arg | Gln | Leu | Leu | Glu | Asn | Thr | Val | Leu | Cys | Gly | Gly | Thr | Thr | Ser |
| | 275 | | | | | 280 | | | | | | 285 | | | |
| Met | Thr | Gly | Phe | Glu | Ser | Arg | Phe | Gln | Lys | Glu | Ala | Asn | Leu | Cys | Ser |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Ser | Ala | Ile | Arg | Pro | Thr | Leu | Val | Lys | Pro | Pro | Glu | Tyr | Met | Pro | Glu |
| 305 | | | | 310 | | | | | | 315 | | | | | 320 |
| Asn | Leu | Gly | Met | Tyr | Ser | Ala | Trp | Val | Gly | Gly | Ala | Ile | Leu | Ala | Lys |
| | | | 325 | | | | | | 330 | | | | | 335 | |
| Val | Val | Phe | Pro | Gln | Asn | Gln | His | Val | Thr | Lys | Ala | Asp | Tyr | Asp | Glu |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Thr | Gly | Pro | Ser | Val | Val | His | Arg | Lys | Cys | Phe | | | | | |
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| atg | gca | aaa | cca | aaa | tcc | aat | tct | cat | ctc | tcg | tgg | cag | gat | tac | ttg | 48 |
| Met | Ala | Lys | Pro | Lys | Ser | Asn | Ser | His | Leu | Ser | Trp | Gln | Asp | Tyr | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| aaa act gtt gcc ccc act cag att ttg tct gaa cga gga gct aat ctc | | | | | | | | | | | | | | | | 96 |
| Lys | Thr | Val | Ala | Pro | Thr | Gln | Ile | Leu | Ser | Glu | Arg | Gly | Ala | Asn | Leu | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| gtt gtc atc aac tta ggg tct gct aat gta aga gta gga ttg gct atg | | | | | | | | | | | | | | | | 144 |
| Val | Val | Ile | Asn | Leu | Gly | Ser | Ala | Asn | Val | Arg | Val | Gly | Leu | Ala | Met | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gat | gag | aaa | cct | ttc | aat | gtt | cct | aat | tgt | att | gca | aga | tac | att | aca | 192 |
| Asp | Glu | Lys | Pro | Phe | Asn | Val | Pro | Asn | Cys | Ile | Ala | Arg | Tyr | Ile | Thr | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| caa | tct | ggg | aaa | cca | act | gtt | gtt | gat | cag | atg | ctt | aac | act | gag | gtc | 240 |
| Gln | Ser | Gly | Lys | Pro | Thr | Val | Val | Asp | Gln | Met | Leu | Asn | Thr | Glu | Val | |
| | 65 | | | | | 70 | | | | 75 | | | | | 80 | |
| act | act | aat | caa | cat | gtt | gac | cgt | gag | aga | gct | tat | aat | tct | gcg | gca | 288 |
| Thr | Thr | Asn | Gln | His | Val | Asp | Arg | Glu | Arg | Ala | Tyr | Asn | Ser | Ala | Ala | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| tcg | ctg | ttg | aag | ata | ctg | ttc | ctg | gat | gaa | agt | tct | tct | tct | ggc | tct | 336 |
| Ser | Leu | Leu | Lys | Ile | Leu | Phe | Leu | Asp | Glu | Ser | Ser | Ser | Ser | Gly | Ser | |
| | | | 100 | | | | | 105 | | | | | | 110 | | |
| gca | tct | cgc | aag | atg | ggg | agg | atc | gac | gga | tac | aat | caa | gcg | agt | acg | 384 |
| Ala | Ser | Arg | Lys | Met | Gly | Arg | Ile | Asp | Gly | Tyr | Asn | Gln | Ala | Ser | Thr | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| ata | aag | aaa | gat | tca | gtc | ttt | act | tgg | act | gat | gtg | tat | gag | gat | gag | 432 |
| Ile | Lys | Lys | Asp | Ser | Val | Phe | Thr | Trp | Thr | Asp | Val | Tyr | Glu | Asp | Glu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| aaa | att | tct | ctt | gcc | tca | cca | gca | gaa | act | tct | cct | gat | aaa | ggg | gat | 480 |
| Lys | Ile | Ser | Leu | Ala | Ser | Pro | Ala | Glu | Thr | Ser | Pro | Asp | Lys | Gly | Asp | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| gct | agt | gca | tct | gaa | gct | gtt | cct | gat | gtt | act | gac | tct | aaa | gat | act | 528 |
| Ala | Ser | Ala | Ser | Glu | Ala | Val | Pro | Asp | Val | Thr | Asp | Ser | Lys | Asp | Thr | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |
| agt | gag | agt | aaa | cgc | aag | tat | agg | aaa | atg | att | ttt | ggg | gaa | gaa | gct | 576 |
| Ser | Glu | Ser | Lys | Arg | Lys | Tyr | Arg | Lys | Met | Ile | Phe | Gly | Glu | Glu | Ala | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| ttg | aaa | ata | tcg | cca | aaa | gag | cca | tat | tgt | tta | tac | cat | cct | att | cgg | 624 |
| Leu | Lys | Ile | Ser | Pro | Lys | Glu | Pro | Tyr | Cys | Leu | Tyr | His | Pro | Ile | Arg | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| aga | ggg | cac | ttc | aat | gtt | tcg | cca | cat | tat | tca | gcg | caa | cgg | gtt | tgt | 672 |
| Arg | Gly | His | Phe | Asn | Val | Ser | Pro | His | Tyr | Ser | Ala | Gln | Arg | Val | Cys | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| gag | gac | tta | act | gct | atc | ttg | gac | tgg | att | tta | tta | gag | aaa | ctt | cat | 720 |
| Glu | Asp | Leu | Thr | Ala | Ile | Leu | Asp | Trp | Ile | Leu | Leu | Glu | Lys | Leu | His | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | |
| ata | act | cac | aag | gag | aga | ttc | tct | ttt | cat | gct | gtt | att | gtt | gtc | cca | 768 |
| Ile | Thr | His | Lys | Glu | Arg | Phe | Ser | Phe | His | Ala | Val | Ile | Val | Val | Pro | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| gaa | aca | ttt | gac | acc | cgc | gaa | ata | aag | gaa | atg | cta | act | att | gtg | ttg | 816 |
| Glu | Thr | Phe | Asp | Thr | Arg | Glu | Ile | Lys | Glu | Met | Leu | Thr | Ile | Val | Leu | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| gga | gag | cta | tac | ttt | aac | tca | gca | gtt | gtc | cac | caa | gaa | ggg | cta | tcg | 864 |
| Gly | Glu | Leu | Tyr | Phe | Asn | Ser | Ala | Val | Val | His | Gln | Glu | Gly | Leu | Ser | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |

| | |
|---|------|
| gcc gtt ttt ggg aat ggt ttg aca aca gct tgt att gtg aat ata gga | 912 |
| Ala Val Phe Gly Asn Gly Leu Thr Thr Ala Cys Ile Val Asn Ile Gly | |
| 290 295 300 | |
| gcc cag aca agt aca gta gtt tgt gtc gag gat ggg gtc tca ttg cca | 960 |
| Ala Gln Thr Ser Thr Val Val Cys Val Glu Asp Gly Val Ser Leu Pro | |
| 305 310 315 320 | |
| aat act gaa aag att tta cct ttt gga gga gag gat ata tgt aga tgc | 1008 |
| Asn Thr Glu Lys Ile Leu Pro Phe Gly Gly Glu Asp Ile Cys Arg Cys | |
| 325 330 335 | |
| ctt cta tgg att cag agg cat tac caa aag tgg cca caa atc aac aca | 1056 |
| Leu Leu Trp Ile Gln Arg His Tyr Gln Lys Trp Pro Gln Ile Asn Thr | |
| 340 345 350 | |
| gat gtt ttg gca aag cca atc gat atg ctg atg ctt aat caa ctt aag | 1104 |
| Asp Val Leu Ala Lys Pro Ile Asp Met Leu Met Leu Asn Gln Leu Lys | |
| 355 360 365 | |
| gag tca ttt tgt gaa att aga gca gga gaa ctt gaa act gtt gca acg | 1152 |
| Glu Ser Phe Cys Glu Ile Arg Ala Gly Glu Leu Glu Thr Val Ala Thr | |
| 370 375 380 | |
| gtt cat tct tat gag gaa ggc atg cca gct gtg cct cac aag aca aat | 1200 |
| Val His Ser Tyr Glu Glu Gly Met Pro Ala Val Pro His Lys Thr Asn | |
| 385 390 395 400 | |
| ctc acc tcc ctt aac gtt cca cca atg ggt ctg ttt tat cct aac ctt | 1248 |
| Leu Thr Ser Leu Asn Val Pro Pro Met Gly Leu Phe Tyr Pro Asn Leu | |
| 405 410 415 | |
| ttg gtc cct gaa ata ttt ccc cag cca cca cgt caa tgg ttt caa gac | 1296 |
| Leu Val Pro Glu Ile Phe Pro Gln Pro Pro Arg Gln Trp Phe Gln Asp | |
| 420 425 430 | |
| tac gag aat atg ttg gaa gac act tgg aac atg gac ttt gga ggt ggt | 1344 |
| Tyr Glu Asn Met Leu Glu Asp Thr Trp Asn Met Asp Phe Gly Gly Gly | |
| 435 440 445 | |
| ggt aac atg gga tta cca atg tgg gat agt ttt gca ttt tcg cct tca | 1392 |
| Gly Asn Met Gly Leu Pro Met Trp Asp Ser Phe Ala Phe Ser Pro Ser | |
| 450 455 460 | |
| aaa cca aag aaa gaa gag aag att ggt ctc gct gaa gcc att aca agc | 1440 |
| Lys Pro Lys Lys Glu Glu Lys Ile Gly Leu Ala Glu Ala Ile Thr Ser | |
| 465 470 475 480 | |
| agc att ctc tct gct gga cgc ata gac ctt aga cgg aag ctt ttc tcc | 1488 |
| Ser Ile Leu Ser Ala Gly Arg Ile Asp Leu Arg Arg Lys Leu Phe Ser | |
| 485 490 495 | |
| agc att caa ttg att ggt ggt gct ggt ttg acg aaa ggt ctt gta gcg | 1536 |
| Ser Ile Gln Leu Ile Gly Gly Ala Gly Leu Thr Lys Gly Leu Val Ala | |
| 500 505 510 | |
| gca gtg gaa gaa aga gtt ctt cac gcg ata cct cca act gaa gcc att | 1584 |
| Ala Val Glu Glu Arg Val Leu His Ala Ile Pro Pro Thr Glu Ala Ile | |
| 515 520 525 | |
| gat aca gtg cag gtt ctg cca tca aga acg gag cca caa ttc gta act | 1632 |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Asp | Thr | Val | Gln | Val | Leu | Pro | Ser | Arg | Thr | Glu | Pro | Gln | Phe | Val | Thr | | |
| 530 | | | | | | 535 | | | | | 540 | | | | | | |
| tgg | aaa | gga | gga | gcg | ata | ttg | gga | att | ctg | gac | ttt | ggg | agg | gag | gct | 1680 | |
| Trp | Lys | Gly | Gly | Ala | Ile | Leu | Gly | Ile | Leu | Asp | Phe | Gly | Arg | Glu | Ala | | |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 | | |
| tgg | att | gag | aga | cat | caa | tgg | atg | gta | aat | ggg | gtt | aat | aaa | ggg | ggt | 1728 | |
| Trp | Ile | Glu | Arg | His | Gln | Trp | Met | Val | Asn | Gly | Val | Asn | Lys | Gly | Gly | | |
| | | | | 565 | | | | | 570 | | | | | 575 | | | |
| cta | aag | aag | tac | aaa | gac | tct | tat | cac | ctt | caa | ggg | caa | gca | atg | tac | 1776 | |
| Leu | Lys | Lys | Tyr | Lys | Asp | Ser | Tyr | His | Leu | Gln | Gly | Gln | Ala | Met | Tyr | | |
| | | | 580 | | | | | 585 | | | | | 590 | | | | |
| ttc | atc | aac | ccc | tag | | | | | | | | | | | | 1791 | |
| Phe | Ile | Asn | Pro | * | | | | | | | | | | | | | |
| | | | 595 | | | | | | | | | | | | | | |

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| Met | Ala | Lys | Pro | Lys | Ser | Asn | Ser | His | Leu | Ser | Trp | Gln | Asp | Tyr | Leu | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Thr | Val | Ala | Pro | Thr | Gln | Ile | Leu | Ser | Glu | Arg | Gly | Ala | Asn | Leu | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Val | Val | Ile | Asn | Leu | Gly | Ser | Ala | Asn | Val | Arg | Val | Gly | Leu | Ala | Met | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Asp | Glu | Lys | Pro | Phe | Asn | Val | Pro | Asn | Cys | Ile | Ala | Arg | Tyr | Ile | Thr | | |
| | 50 | | | | 55 | | | | | 60 | | | | | | | |
| Gln | Ser | Gly | Lys | Pro | Thr | Val | Val | Asp | Gln | Met | Leu | Asn | Thr | Glu | Val | | |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | | | |
| Thr | Thr | Asn | Gln | His | Val | Asp | Arg | Glu | Arg | Ala | Tyr | Asn | Ser | Ala | Ala | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Ser | Leu | Leu | Lys | Ile | Leu | Phe | Leu | Asp | Glu | Ser | Ser | Ser | Ser | Gly | Ser | | |
| | | | 100 | | | | | 105 | | | | | | 110 | | | |
| Ala | Ser | Arg | Lys | Met | Gly | Arg | Ile | Asp | Gly | Tyr | Asn | Gln | Ala | Ser | Thr | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Ile | Lys | Lys | Asp | Ser | Val | Phe | Thr | Trp | Thr | Asp | Val | Tyr | Glu | Asp | Glu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Lys | Ile | Ser | Leu | Ala | Ser | Pro | Ala | Glu | Thr | Ser | Pro | Asp | Lys | Gly | Asp | | |
| 145 | | | | | 150 | | | | | 155 | | | | 160 | | | |
| Ala | Ser | Ala | Ser | Glu | Ala | Val | Pro | Asp | Val | Thr | Asp | Ser | Lys | Asp | Thr | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| Ser | Glu | Ser | Lys | Arg | Lys | Tyr | Arg | Lys | Met | Ile | Phe | Gly | Glu | Glu | Ala | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| Leu | Lys | Ile | Ser | Pro | Lys | Glu | Pro | Tyr | Cys | Leu | Tyr | His | Pro | Ile | Arg | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Arg | Gly | His | Phe | Asn | Val | Ser | Pro | His | Tyr | Ser | Ala | Gln | Arg | Val | Cys | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Glu | Asp | Leu | Thr | Ala | Ile | Leu | Asp | Trp | Ile | Leu | Leu | Glu | Lys | Leu | His | | |
| 225 | | | | | 230 | | | | | 235 | | | | 240 | | | |
| Ile | Thr | His | Lys | Glu | Arg | Phe | Ser | Phe | His | Ala | Val | Ile | Val | Val | Pro | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| Glu | Thr | Phe | Asp | Thr | Arg | Glu | Ile | Lys | Glu | Met | Leu | Thr | Ile | Val | Leu | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | |
| Gly | Glu | Leu | Tyr | Phe | Asn | Ser | Ala | Val | Val | His | Gln | Glu | Gly | Leu | Ser | | |

| | | |
|-------------------------|-------------------------|-----------------|
| 275 | 280 | 285 |
| Ala Val Phe Gly Asn Gly | Leu Thr Thr Ala Cys Ile | Val Asn Ile Gly |
| 290 | 295 | 300 |
| Ala Gln Thr Ser Thr Val | Val Cys Val Glu Asp Gly | Val Ser Leu Pro |
| 305 | 310 | 315 |
| Asn Thr Glu Lys Ile Leu | Pro Phe Gly Gly Glu Asp | Ile Cys Arg Cys |
| 325 | 330 | 335 |
| Leu Leu Trp Ile Gln Arg | His Tyr Gln Lys Trp Pro | Gln Ile Asn Thr |
| 340 | 345 | 350 |
| Asp Val Leu Ala Lys Pro | Ile Asp Met Leu Met Leu | Asn Gln Leu Lys |
| 355 | 360 | 365 |
| Glu Ser Phe Cys Glu Ile | Arg Ala Gly Glu Leu Glu | Thr Val Ala Thr |
| 370 | 375 | 380 |
| Val His Ser Tyr Glu Glu | Gly Met Pro Ala Val Pro | His Lys Thr Asn |
| 385 | 390 | 395 |
| Leu Thr Ser Leu Asn Val | Pro Pro Met Gly Leu Phe | Tyr Pro Asn Leu |
| 405 | 410 | 415 |
| Leu Val Pro Glu Ile Phe | Pro Gln Pro Pro Arg Gln | Trp Phe Gln Asp |
| 420 | 425 | 430 |
| Tyr Glu Asn Met Leu Glu | Asp Thr Trp Asn Met Asp | Phe Gly Gly Gly |
| 435 | 440 | 445 |
| Gly Asn Met Gly Leu Pro | Met Trp Asp Ser Phe Ala | Phe Ser Pro Ser |
| 450 | 455 | 460 |
| Lys Pro Lys Lys Glu Glu | Lys Ile Gly Leu Ala Glu | Ala Ile Thr Ser |
| 465 | 470 | 475 |
| Ser Ile Leu Ser Ala Gly | Arg Ile Asp Leu Arg Arg | Lys Leu Phe Ser |
| 485 | 490 | 495 |
| Ser Ile Gln Leu Ile Gly | Gly Ala Gly Leu Thr Lys | Gly Leu Val Ala |
| 500 | 505 | 510 |
| Ala Val Glu Glu Arg Val | Leu His Ala Ile Pro Pro | Thr Glu Ala Ile |
| 515 | 520 | 525 |
| Asp Thr Val Gln Val Leu | Pro Ser Arg Thr Glu Pro | Gln Phe Val Thr |
| 530 | 535 | 540 |
| Trp Lys Gly Gly Ala Ile | Leu Gly Ile Leu Asp Phe | Gly Arg Glu Ala |
| 545 | 550 | 555 |
| Trp Ile Glu Arg His Gln | Trp Met Val Asn Gly Val | Asn Lys Gly Gly |
| 565 | 570 | 575 |
| Leu Lys Lys Tyr Lys Asp | Ser Tyr His Leu Gln Gly | Gln Ala Met Tyr |
| 580 | 585 | 590 |
| Phe Ile Asn Pro | | |
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 <220>
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